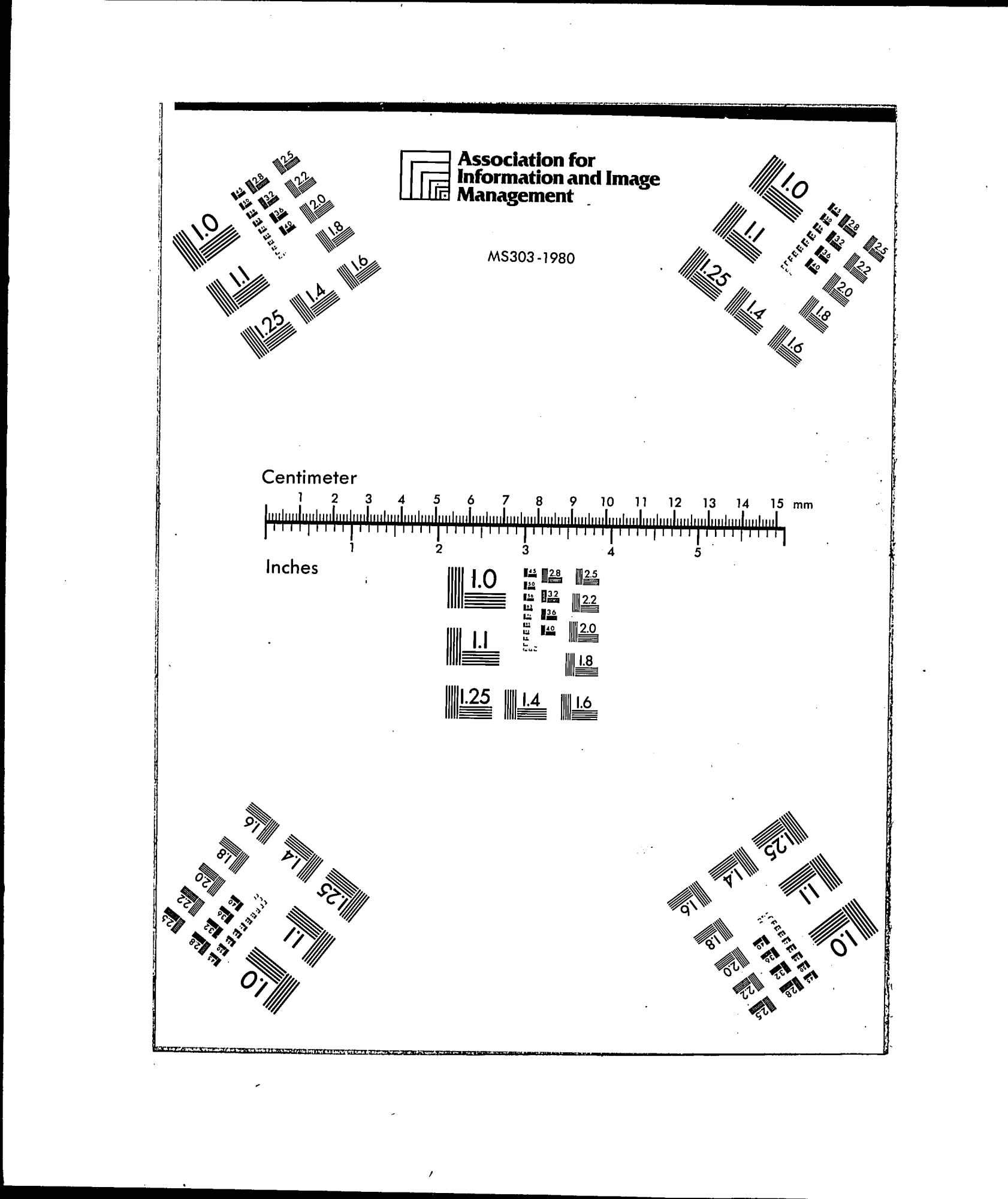
Association for
Information and Image
Management
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Centimeter
Inches
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# Thomas A. Edison Papers

*A SELECTIVE MICROFILM EDITION*

*PART II*
*(1879–1886)*


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# START

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THOMAS A. EDISON PAPERS

A SELECTIVE MICROFILM EDITION
PART II
(1879–1886)

REEL 44

NOTEBOOK SERIES (NBK-22)

Pocket Notebooks (continued)

Technical Scrapbooks

Unbound Notes and Drawings

## Pocket Notebook, PN-78-02-24

This pocket notebook was kept by Charles Batchelor during the period February 1878-January 1879. The book contains entries relating to items, primarily telephones and phonographs, that were made at the laboratory and shipped to various companies and individuals. The front cover is inscribed "Work turned out of Edison's Laboratory During 1878." The pages are unnumbered. Only 14 pages have been used.

| | | | |
|---|---|---|---|
| 1 | Model for Competition | | |

| | | | |
|---|---|---|---|
| | Patent office Models | | |
| 1 | For telephone | connection. | |
| 2 | For telephone | different | |
| | application | | |
| 1 | For Tel. call | | |
| 1 | For Phonograph | | |
| 2 | For Aerophone | | |

We have made 4 entrances
8 Large Cylinder —
— Phonographs
Aug 11 Small ditto —

Apl 21 James Adams
took to England
2 Sounder brackets
2 Relay "
6 Receivers
1 Receiver soft iron
6 Transmitters
1 600 ohm Induction Coil
on Base
12 Cords for telephones

Apl 25 James Adams
2 Small Phonographs
in boxes

H Bentley. Philadelphia
2 Pine Sounding Brackets
2 Transmitters
1 Cut transmitter
2 Cords.

W H Preece
1 Cut Transmitter

Apl 3 N.Y. Tel. Co. Broadway Ny
1 Sounding bracket
1 Cast Iron transmitter
1 Receiver
1 Unadjustable Transmitter
1 Induction coil
3 Cords for telephones.

Apl 4 1878 H Bentley Phil.
1 Cast Iron Transmitter
2 Rubber receivers
3 Cords for same.

Apl 10 1878 Lee Rickes London
4 Cast Iron transmitters for telephone
4 Sounding brackets ditto
2 Relay " "
2 Nickeled call bells "
6 Receivers for "
15 Telephone cords

Apl 10 1878
James Adam London
1 Small transmitter not adjustable

Apl 11 1878
Geo F Barker
Philadelphia
1 Transmitter
1 Receiver 8 Rolls tinfoil paper
1 Coil on base

1878

Apl 16 Left New Haven for Parker

2 Coils in box for Batchelor & Sale to Washington

1 Long Phonograph & Johnson Shivers Edisons private use

1878.

Apl 23

2 Small transmitters

45 Carbons pressed

Sent to Adams in England by Col G. E. Gouraud

1878

April 16 1 Rubber transmitter & Coil left with Sawyer

April 25th 1 Small transmitter given with Rheps for model.

Apl. 30 1 Model transmitter and 26 Carbons pressed

May 3. 12 Carbons pressed sent to Dr Barker

May 7 1 Cylinder Phono

4 Tel transmitters

4 Rl Receivers

abt 10 cords

4 Coils 

with rack for holding telephones in use in Panama

May 10 2 new Trans.
2 " Receivers
2 Coils with
brass tele stands
4 Cords. Sent to Bentley

May 24 2 new Trans
2 " Receivers
2 bases with telephone
brackets on
4 Cords
2 small Grinders
Sent to Gold & Stock Tel Co

25 2 new adjustable
transmitters in place
of former 2

June 6 St Barker
1 Good Rubber transmitter
2 unfinished
4 Carbon buttons.

Roberson Phil.
2 receivers loaned

June 6 G M Phelps
Paid 100 carbon buttons and
drawers for them
200 cells

June 7 Western Electric Mfg Co
2 Model transmitters
1 Coil box cord

June 12 Frank McLaughlin
2 new large Phonographs
12 Springs. Lot 2 in foil

June 15 W. E. Mfg. Co.
20 Carbons
21 Silk discs

Prof Langley
10 Carbons
Allegheny Pa

Made one Quadruplex resistance baldncer
9 + Stock

June 17 4 Transmitters
4 Coils mounted on bases without switches

18 1 Coil mounted on base without switch to Dr Barker
also 1 Pressure relay.

Sent Back

18 A. A. Dale & Co
1 Model Monograph

18 E. H. Johnson
1 Double ear piece

19 Gold & Stock Tel Co
2 Transmitters
2 Coils mounted on bases without switches

July 3. 2 Transmitters
1 Pressure relay
1 Key
1 Sounder
32 Carbons
1 box silk Rs

Sent Back at Paris

July 27. Made new Magnets for Patrick Carter telephones

Rec'd Carter Telephone Bar Loaned to Pen Office

N. H. Painter Mark 1 Pair Telephones

Geo Pair Bells & Batteries on A.T. St Depot

Jas Scott Pool Phone to Geo W Barker

Sept 21 Pair of Microgaphe Receiver. Box and Connections

Nov 26. 1879

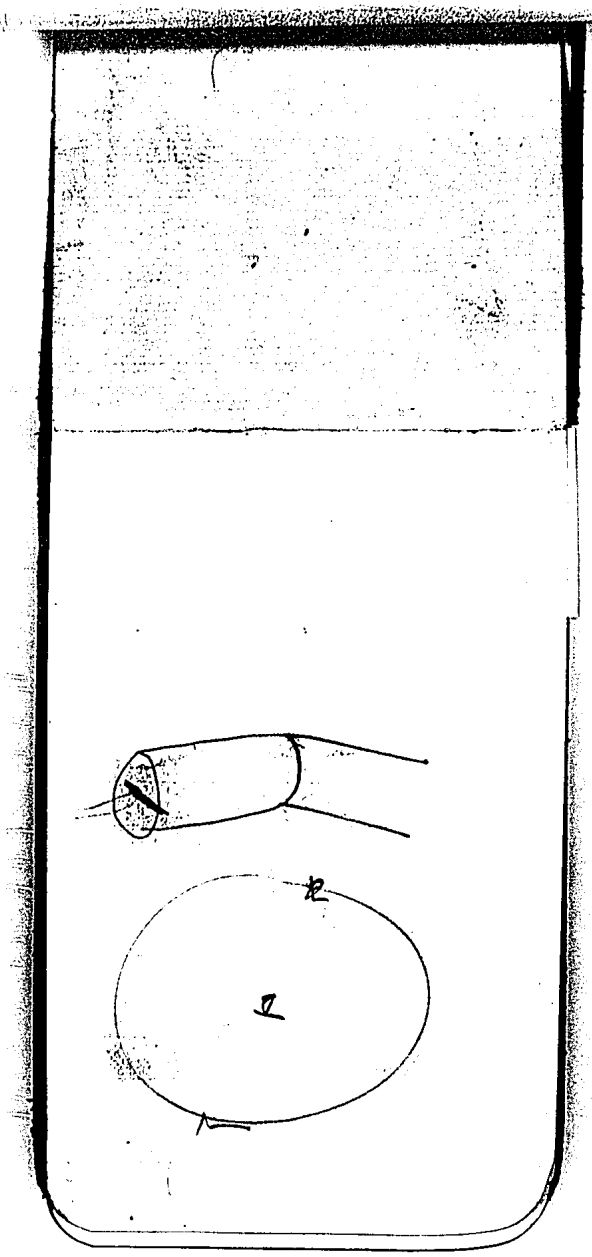
N N Barr one Iron Phonotype

one Iron Phone to Leyden

E H Johnson

## Pocket Notebook, PN-82-04-01

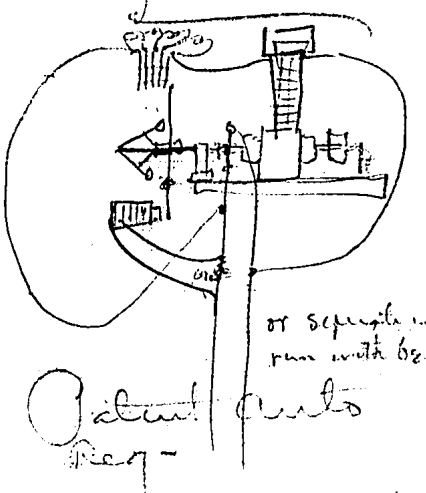
This pocket notebook covers the period April 1882-April 1883. The entries are by Edison and consist of notes and drawings relating to dynamos and dynamo regulators, a lamp caveat, an autographic telegraph, and a process for making glue from a plant. Included also are miscellaneous calculations, a memorandum about the stock of various companies, a list of cities in Latin America, and a few notes by Edison to himself. The pages are unnumbered. Approximately 75 pages have been used.



April 1. 1882

Patent

Wind 2 armatures with fine wire for 6 arc lights in series + coil winding for 4 lights =



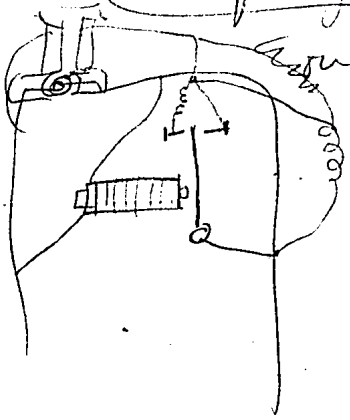
or separately in run with belt.

Patent Curtis Reg-

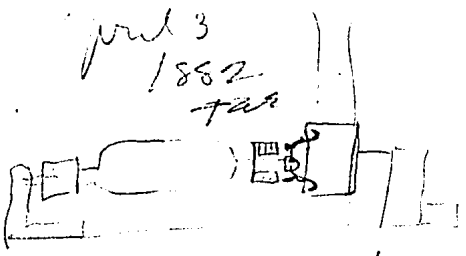
April 1 1882

The bush like growth
in tropical sea that is
coated with flesh Color
lime & which is of
animal origin appears
like ~~bone~~ & when burnt
smells like burnt horn
I propose to make into
glue, after collecting
from the ~~reef~~ Sea it
is dried put into a
tumbling Barrel
with iron pieces
& ground from lime

it is then cut up
beaded in the usual
manner for a Che



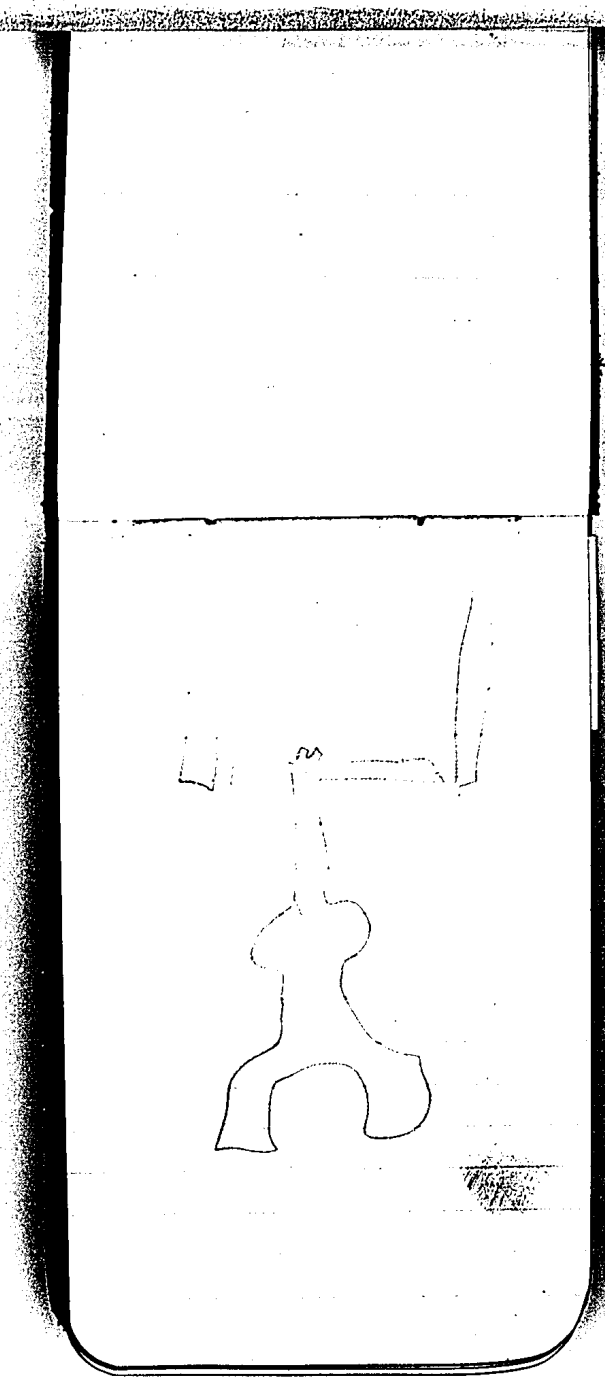
Apr 13 1882
Circuit Req

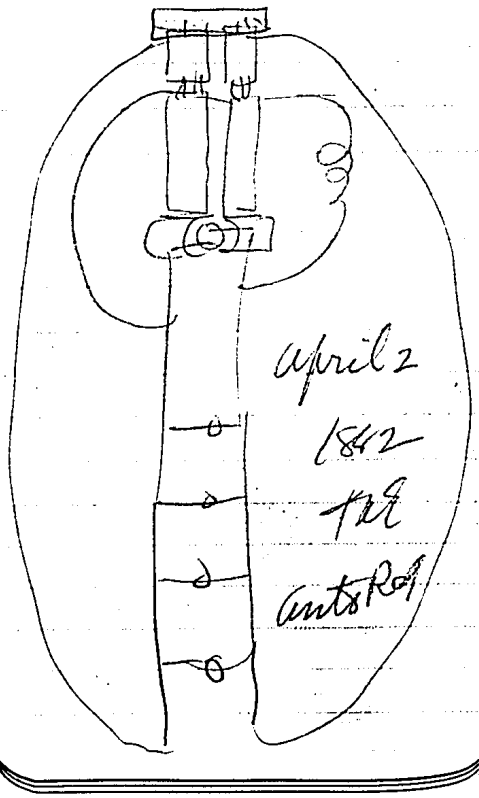


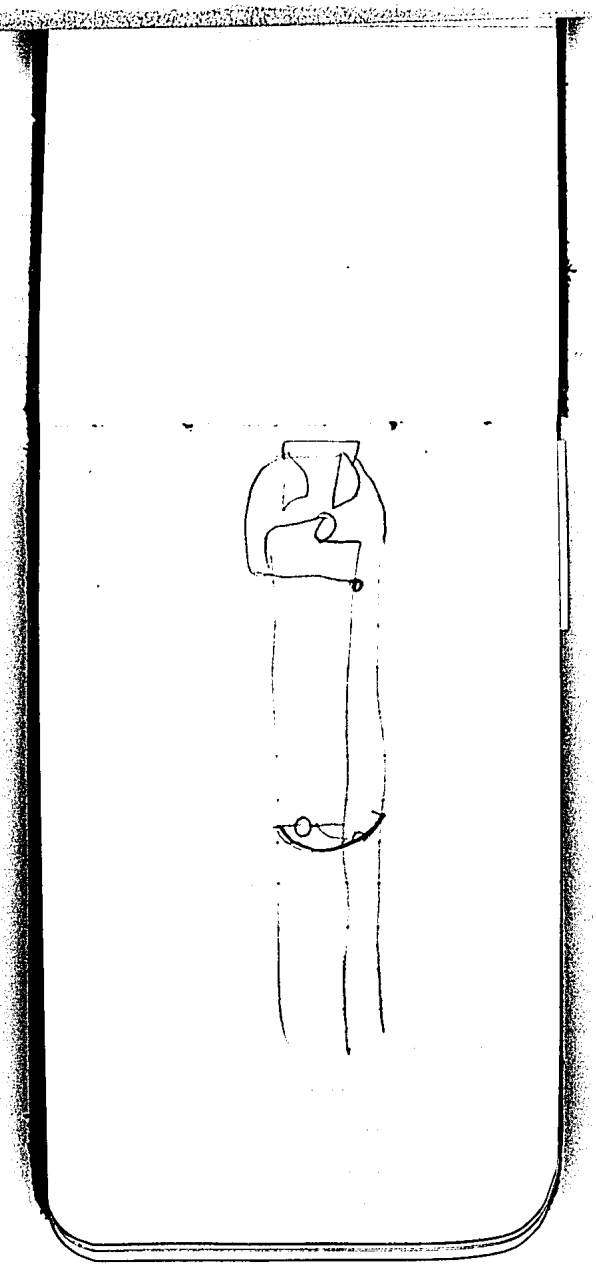
April 3
1882
Tar

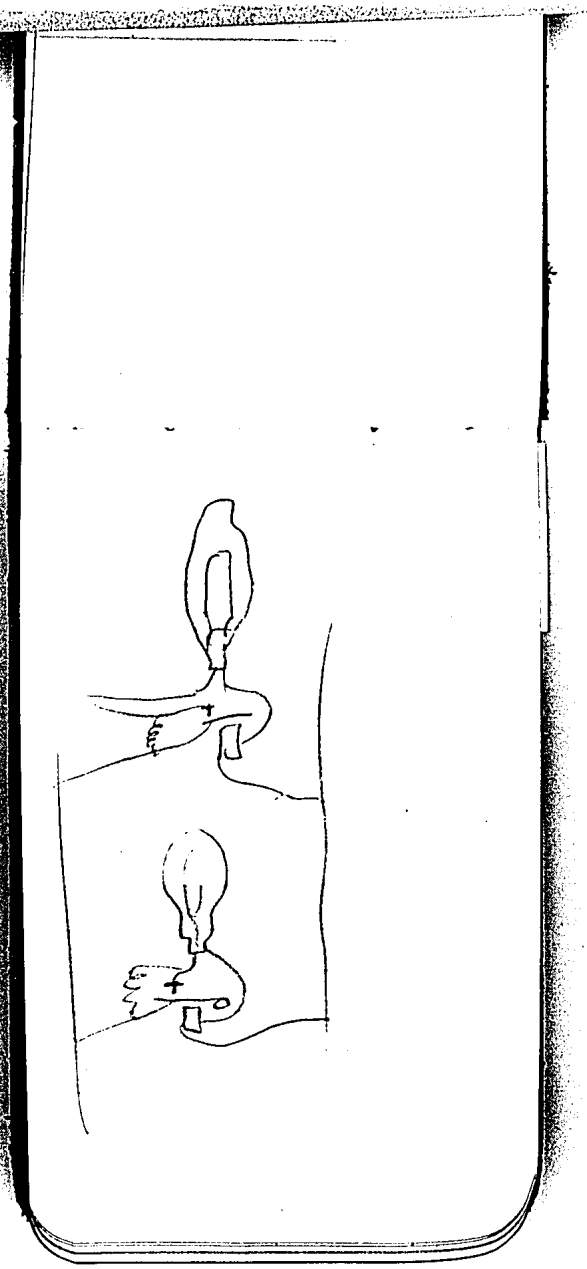
Magnet & shaft
Seems to have large
area pole to
friction between
Brass shaft head
Prevents drop
of Emf -

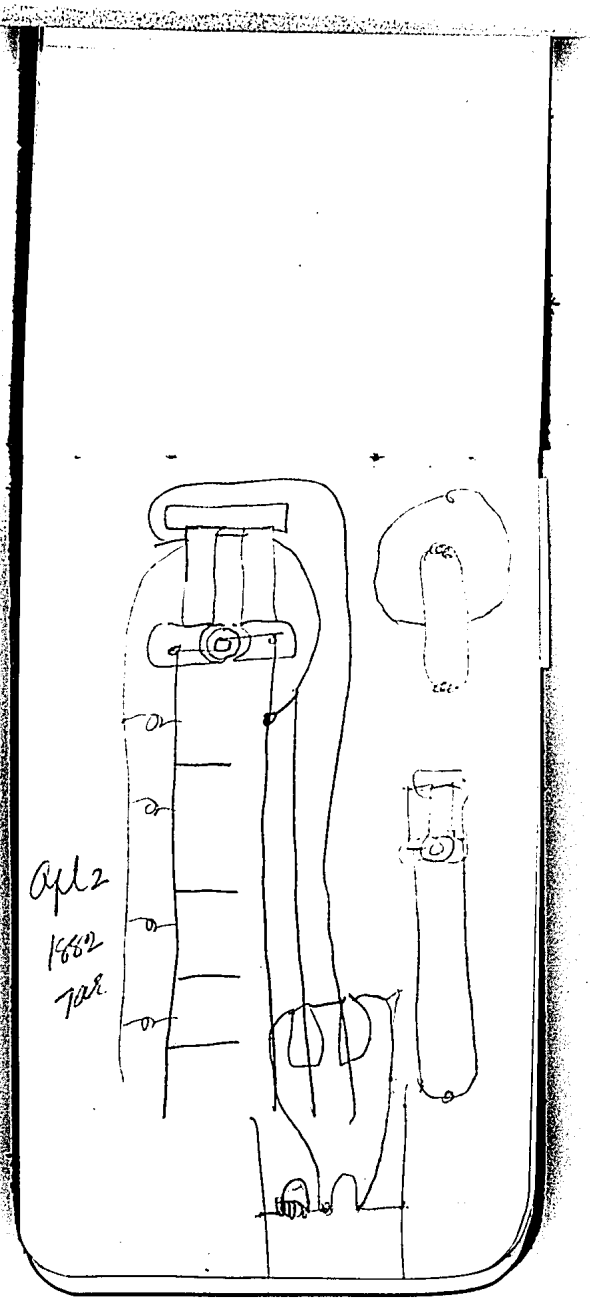
Ants Roy

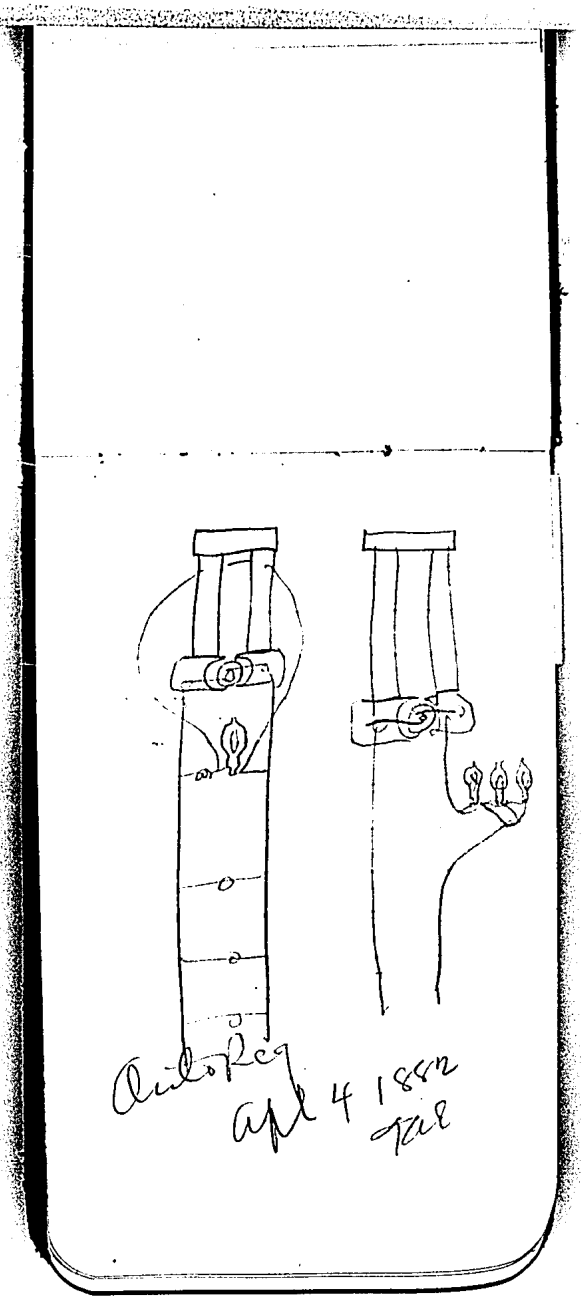


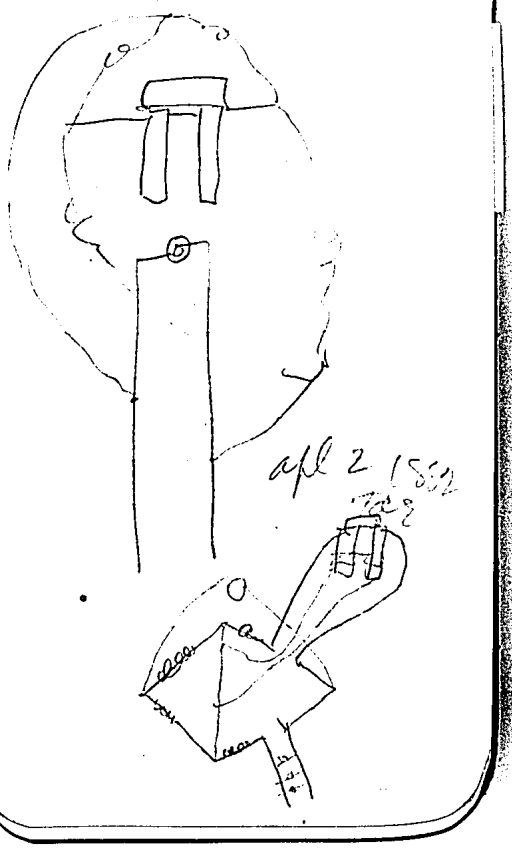

April 2
1862
Pat
Ants Rat

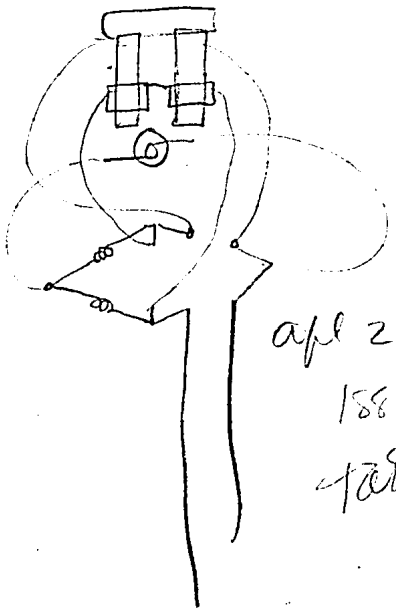




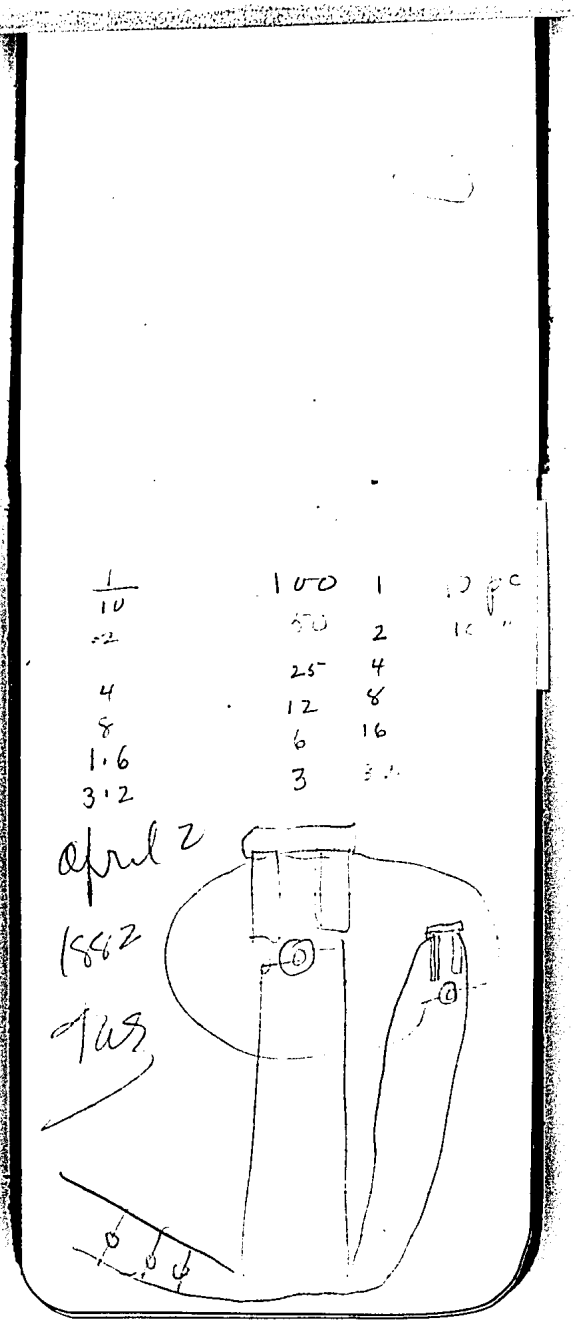

Apl 2
1882
Jar.

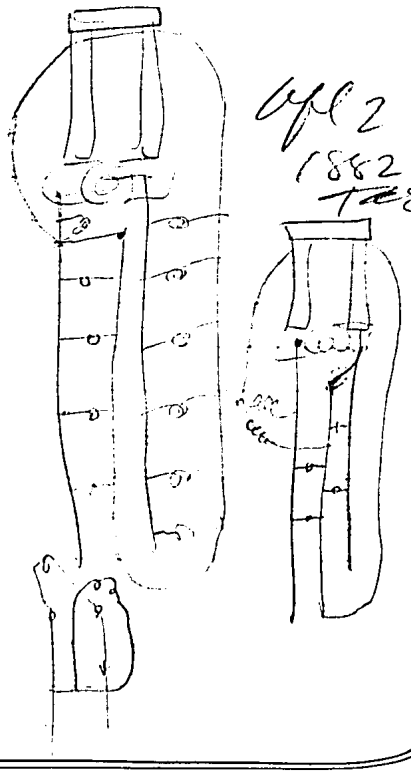

Auto Reg
Apl 4 1882

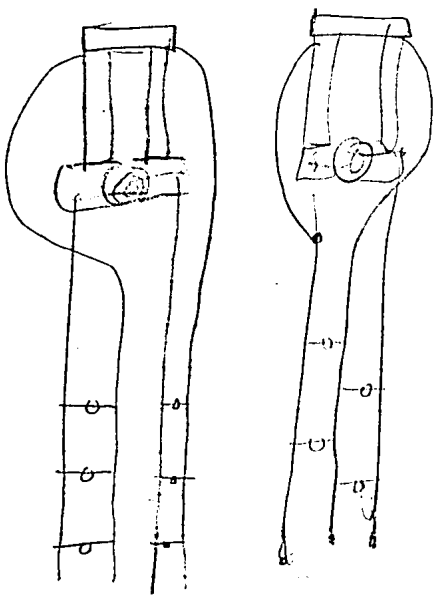

apl 2 1512



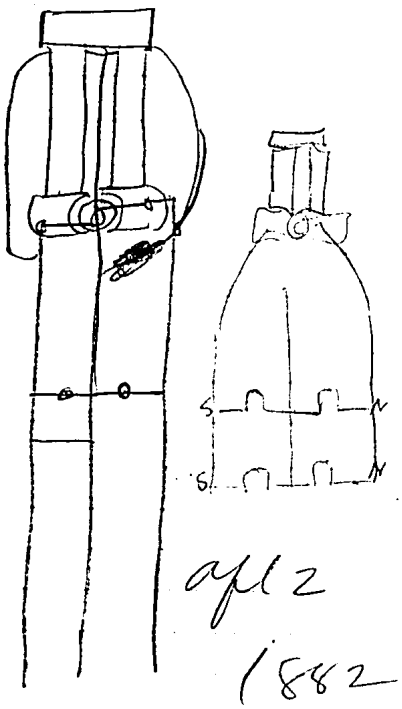
apl 2
1882
4a8


1/10
1/2
4
8
1.6
3.2
100
50
25
12
6
3
1
2
4
8
16
April 2
1862


Apl 2
1882

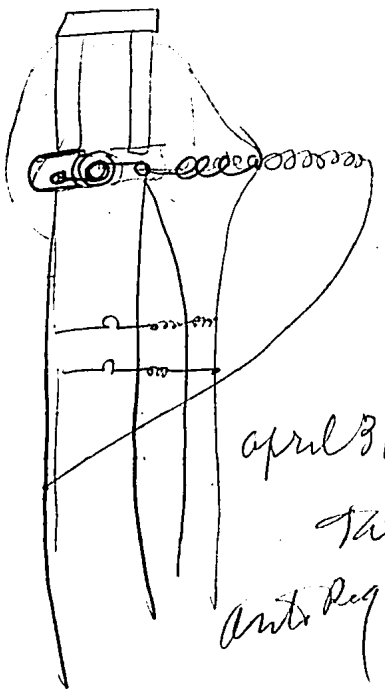


apl 2 1882

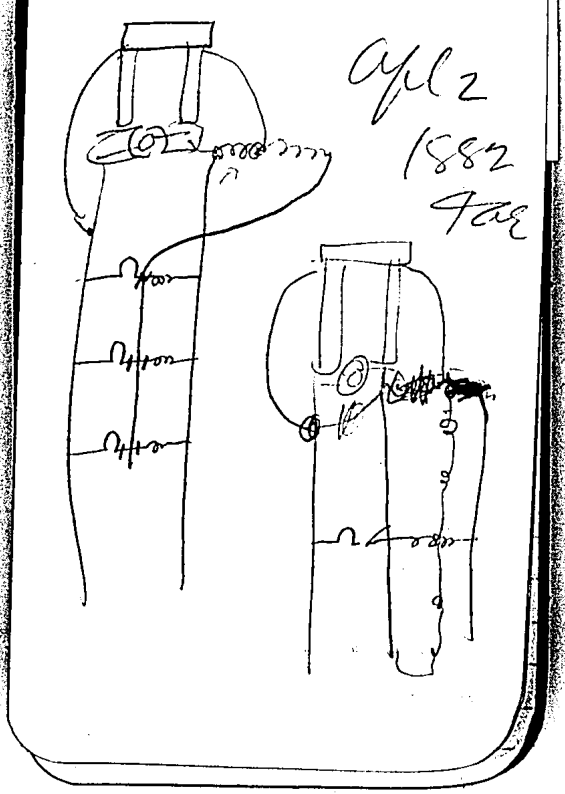


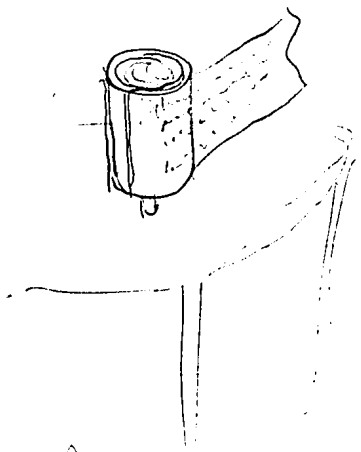
apl 2

1882



April 3 1862
Jas
Antis Reg


April
1882

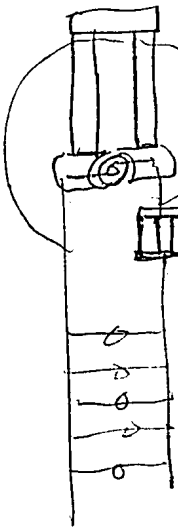


Inside roll-faucet
paper Cover on patent
in Kenny Trainmill
Apl. 2 1882

Autographic try
~~double~~ double
paper. Starch between
or other unbalanced
outside paper to be
thin as Corona
this will do the
biz for indentation
Apl 2 1882
T.A.E.

ask gen Eckert
for a standard
table ~~+ doors~~
figure out a
duplex for analogy

$25 per year each
guarantee.
300, if they use
10.
$4000 per year if
they don't use or
all for Central pur-



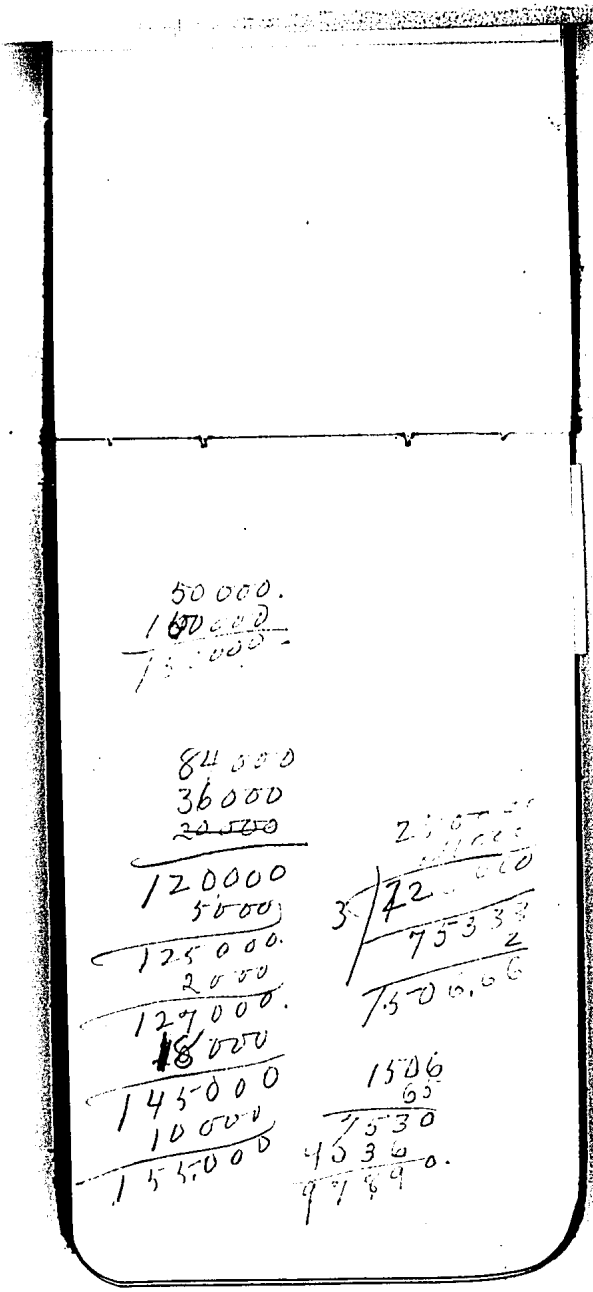
Carbon rods
decreased by
additional lamps

Cyl 2

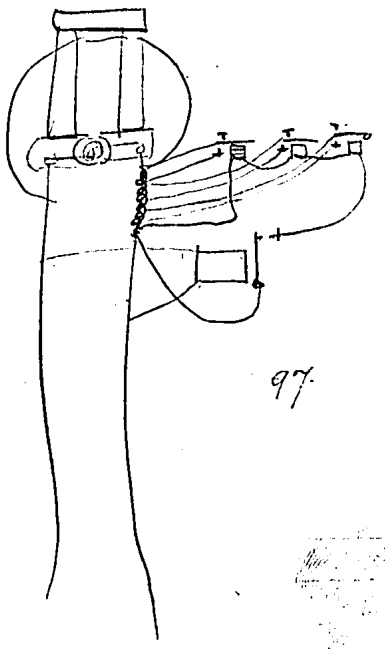
1884

4 M

Pulsar

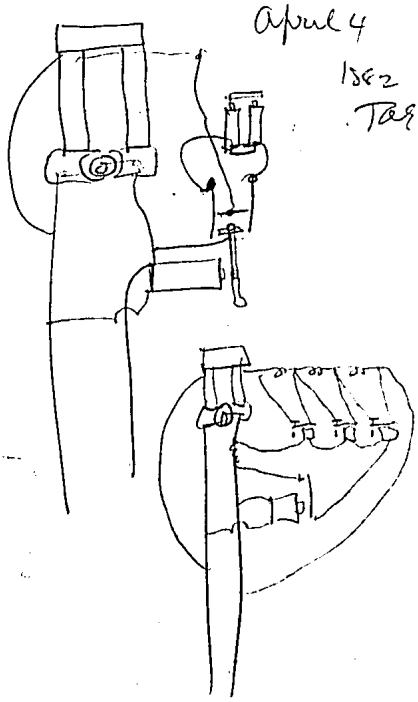


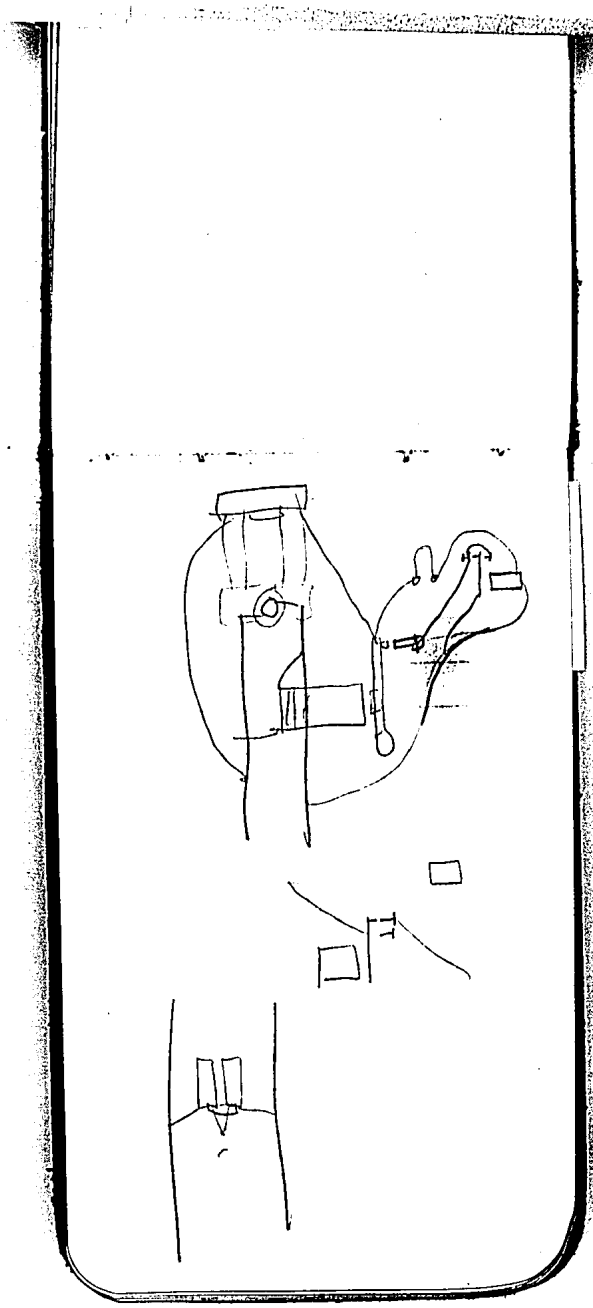
April 5 1882 TAE.

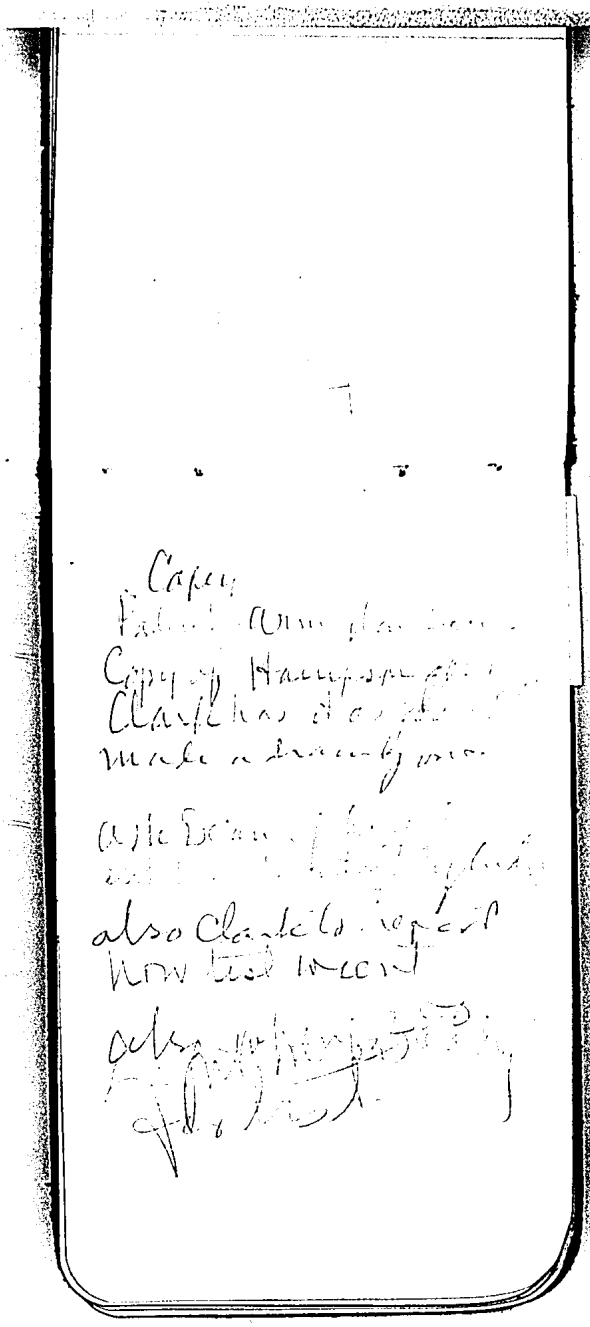


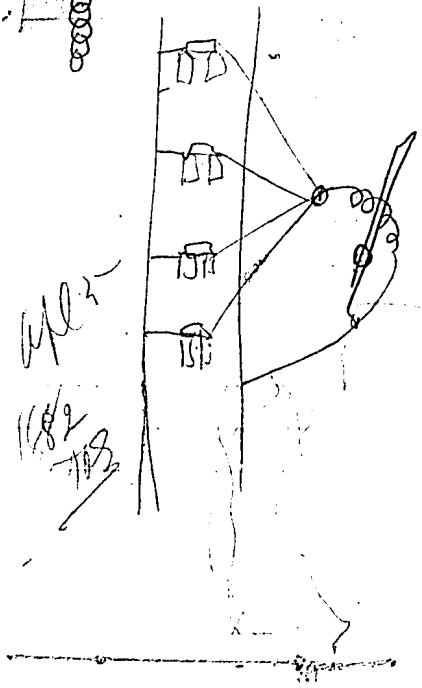
97.

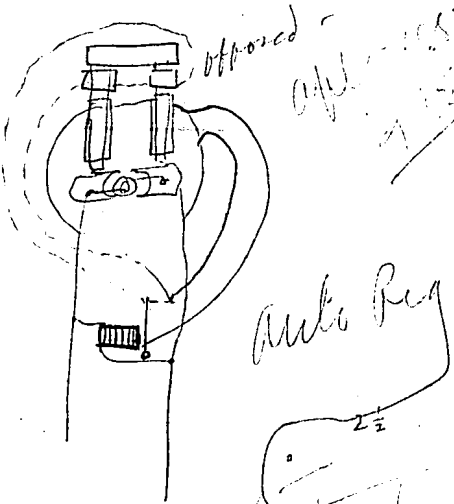
April 4
1862
Tar

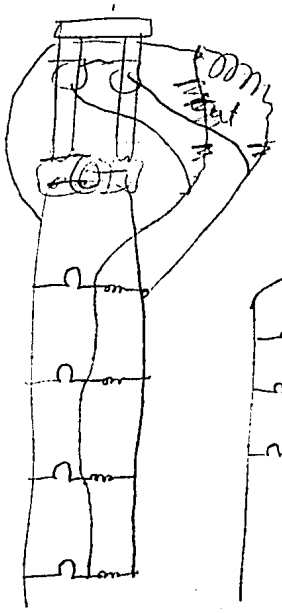


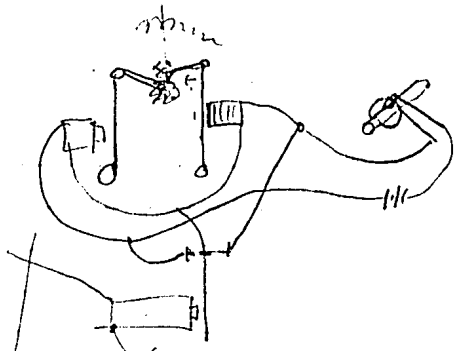







Auto Reg

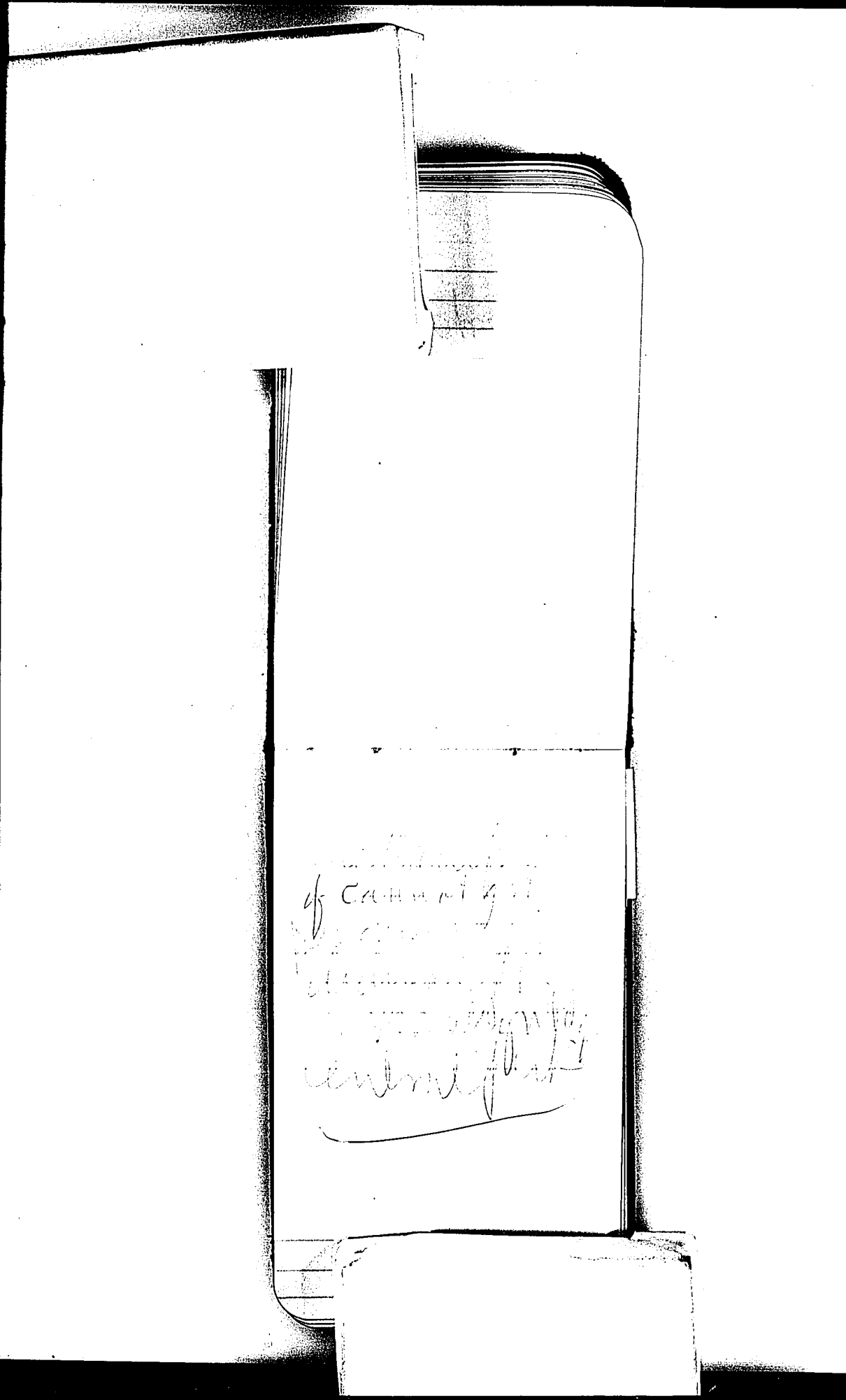




Auto Reg

Apl 5 1852

-Tab



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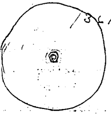
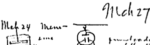


Mch 27 1883 TAE

Mch 24 Memo—



J F O.B.

ask Clarke why cant deposit [illegible] when sending in to [illegible] from other plate — ask Seely abt. auto compensator, also clamps —

Try heating at 300 fahr above abouts bamboo for 6 hours in unboiled Linseed — Oil Mirbane, Aniline oil. Sulphuric acid — Linseed containing Rosin — also ammonia sal of tragacanth — also glycerine, also Paraffine, Coal tar, petroleum residue, Resin. Turpentine also Venice turpentine.

Send to Holzer for 1000 splints to prepare these,

ask Clarke if 100 meters as found show on 30 lights if correction cannot be made —

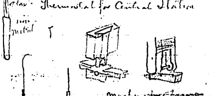
Have ~~Bergmann~~ our ~~drawing~~ designs now [illegible]!

— Try flour paste on [illegible] & get oxalic acid

Try hard boiled linseed on [illegible] & make Cuprous ammon

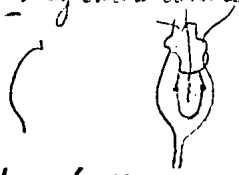
ascertain if Zinc immersed in Sol Zinc with hot hard rubber shavings oxidize —

Solar — Thermostat for Central Station

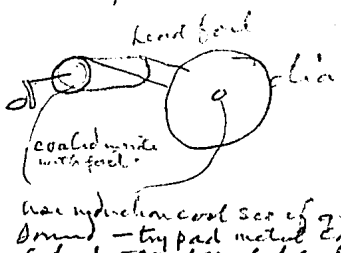


Machine for Clamps

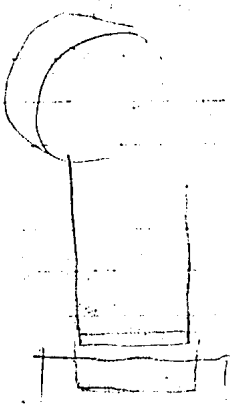
Boil water in Meter bottle or rather put Zinc plate in tube with Sul Zinc boil + seal by fusion -
immerse that white stuff made by Cake where tip is seal in -



Tellurium bottle - for meter
to make Hydrogen pressure
polish new plat-electrodes
less corrosion -
one carbon with the other ground
2nd carbon to be heated by 2nd -
& use as a platinite to work relay




Use induction coil see of gal
Ammo - try pad metal Zn Li
Cylinder amalgamated surface



Dechanel make Faraday & Angstrom curtains rotation for water March 27 1873 far No 5

Try with Shellac, Cup ammonium paper, paste board Canada balsam dissolved & other things to strike fibre, long ether & then carbon disulphide in closed polariscope tubes to see if it will

write plan to Coat same fibre with paper soaked to prevent Combining —

Try some dilute Hydrofluoric on insoluble Carbide of Cobalt

get some small polarising Cam tubes Carbon fibre in Dissolved Zinc sat Sol Chloride Zinc

Formula peroxide lead
4 parts Crystallized acetate Lead
3 parts Carb Soda
pass chlorine

262

200
12
400
2000
2400

7 2000
2012
14000
14400
72000
86400

200.
7
1400.
30
42,000
42,116
25-2000
42000
6720.00
1.70
42,000

35-
5-
175-
7
1225-
380.

1200.
30
36,000

16.0
5-
80
400

75
20
1500

6 | 350
50

Foundation 200
Boiler 1500
~~Building~~ 3000
Engine 1875
Piping 350
Pump 275
~~Belt~~ 80
Etc Excavation 100
Engineering 250
Water 300
7930.
600
8.5-30

7

3

240
68 30 00
3-0.4 00
250.

60
24
240
30
350 7200

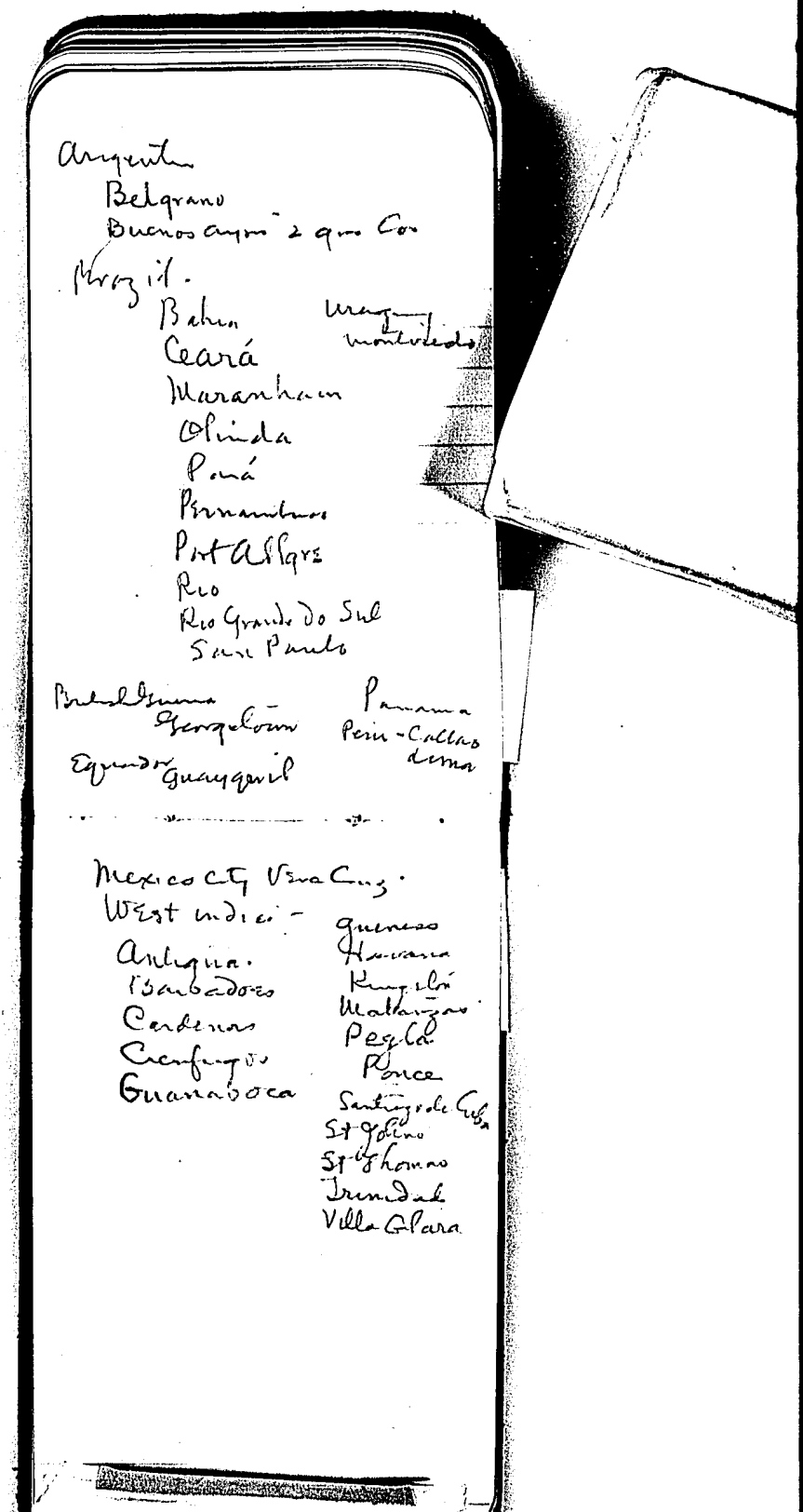
90. Engr.
230 Cdac
120. Lamps
6. Oil
446.

350
7
245-0
30
735-00 (120
600 0
135 0
120 0

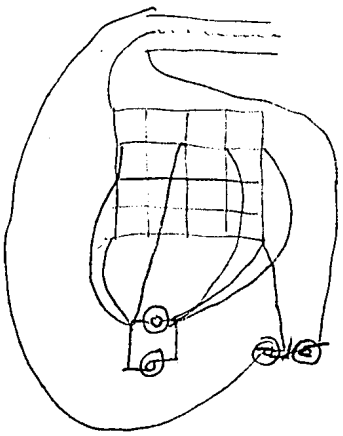
446.

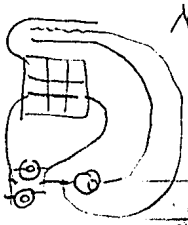
pg
12
36
18
216

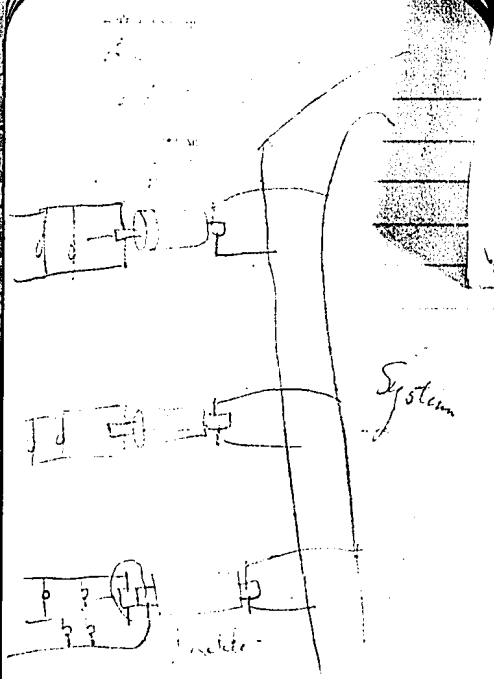
27
10
270

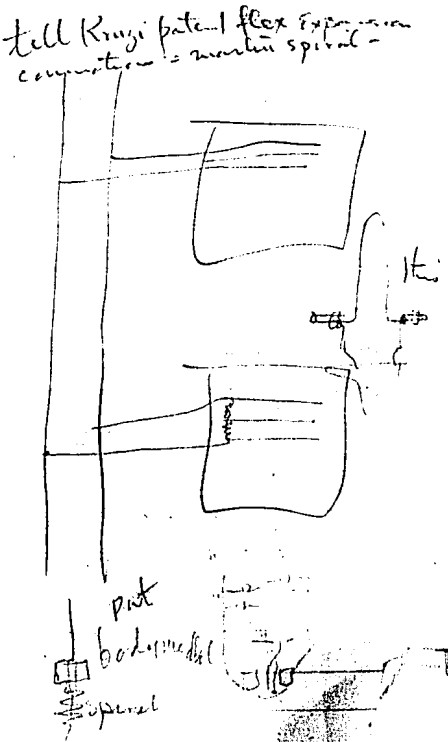


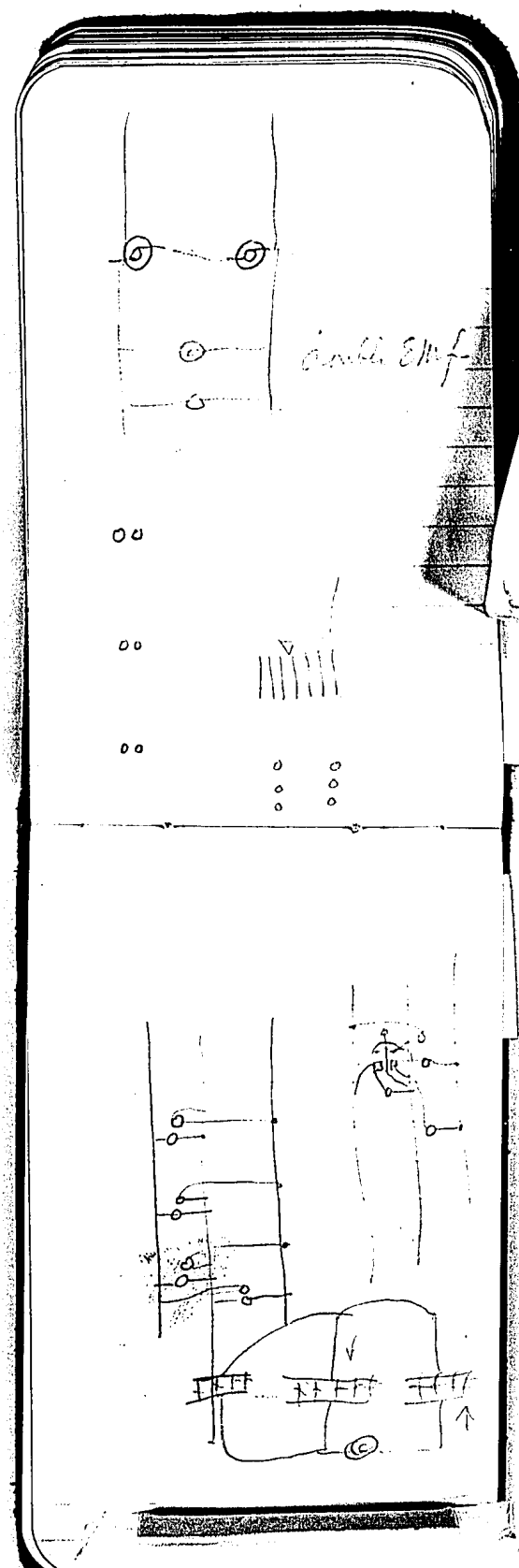
Argentina
Belgrano
Buenos ayres 2 qrs Co.
Brazil.
Bahia
Ceará
Maranham
Olinda
Pará
Pernambuco
Port Alegre
Rio
Rio Grande do Sul
San Paulo
Montevideo
Buenos Ayres
Georgetown
Ecuador Guayaquil
Panama
Peru - Callao
Lima
Mexico Ct Vera Cruz.
West indies -
Antigua.
Barbadoes
Cardenas
Cienfuegos
Guanaboca
Guemeso
Havana
Kingston
Matanzas.
Pegld
Ponce
Santiago de Cuba
St Croix
St Thomas
Trinidad
Villa Clara


No 1

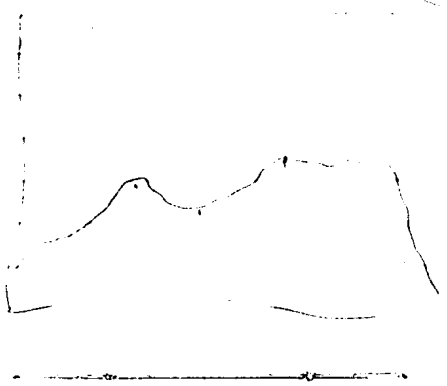

No 2


System


till Kinzi patent flex
pivot
bodymedia
Espenet

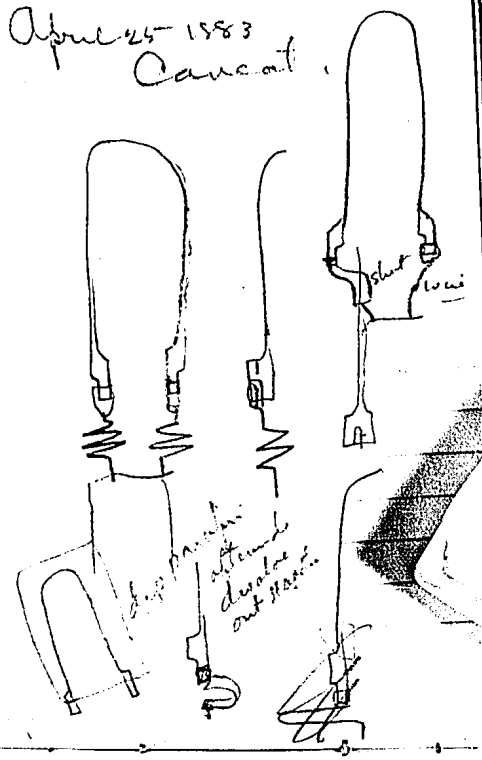


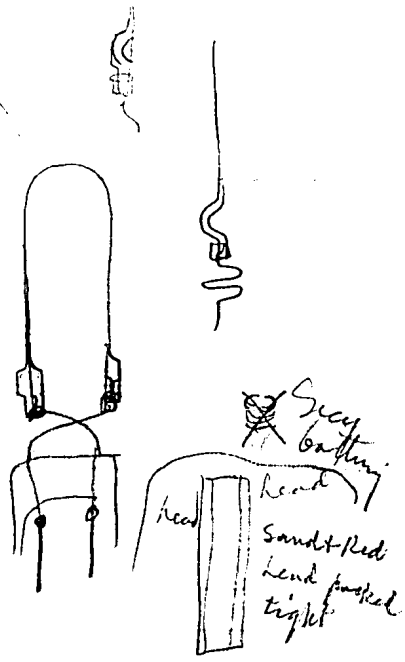
| | 1871 | 1874 |
|---|---|---|
| Metpol Bank | 108 – | 2 |
| Roy Can " | 101 | 93 |
| Mont Tel Co. | 200 | 133 |
| Dom Tel Co | 110 | 87 |
| Richelieu Nav Co | 230 | 61 |
| New City Gas Co | 204 – | 148 |



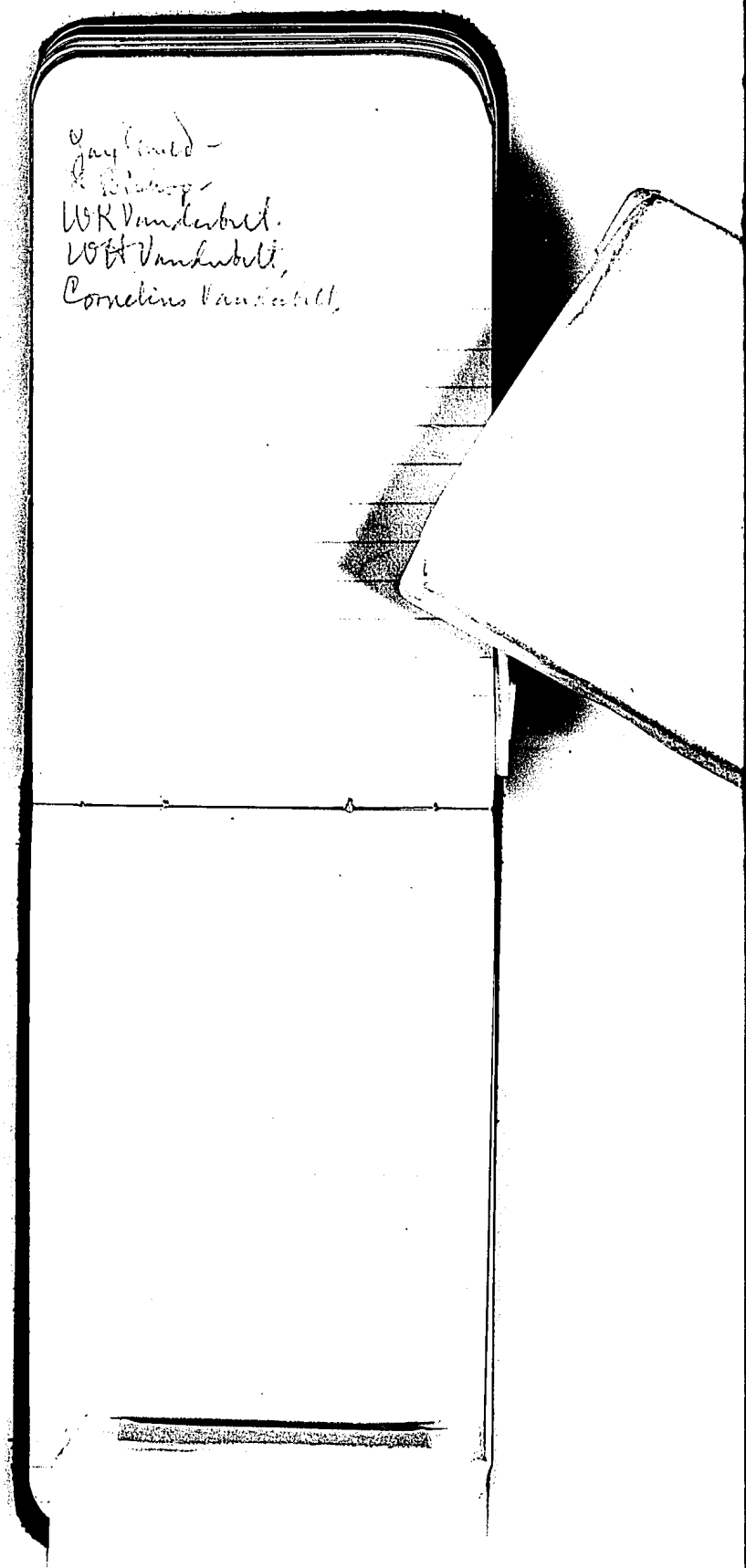
April 25 1883

Caveat.




also Silica fine
of Red Lead
held under pressure

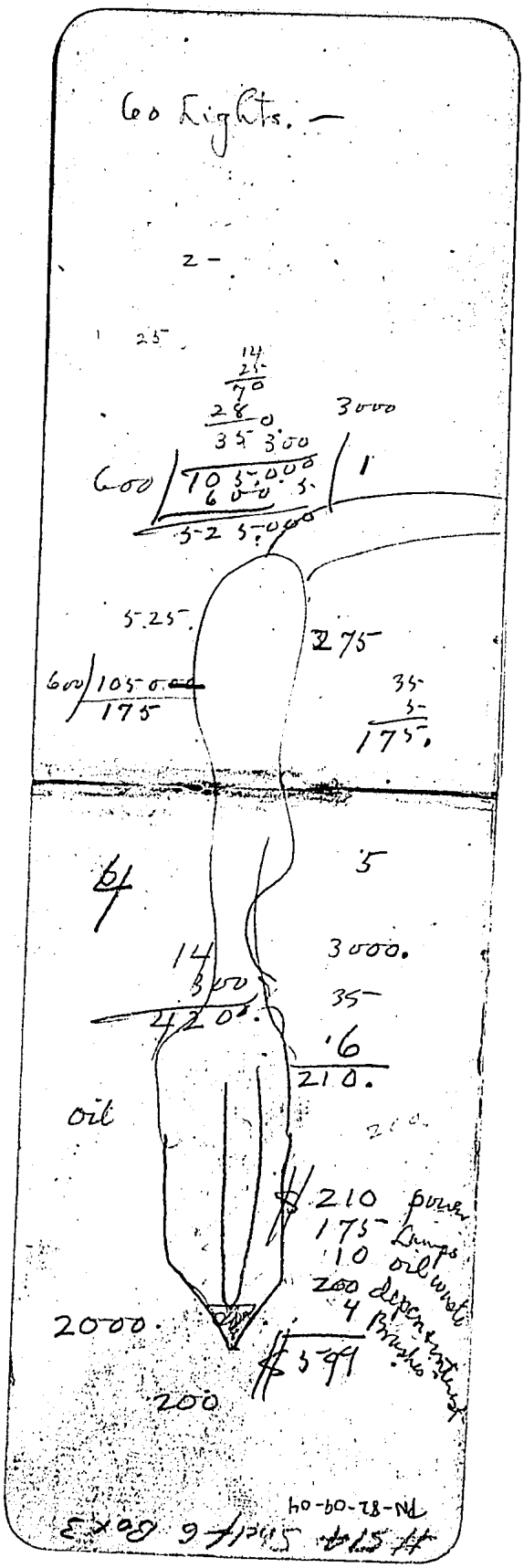

Jay Gould -
WK Vanderbilt.
WH Vanderbilt,
Cornelius Vanderbilt,

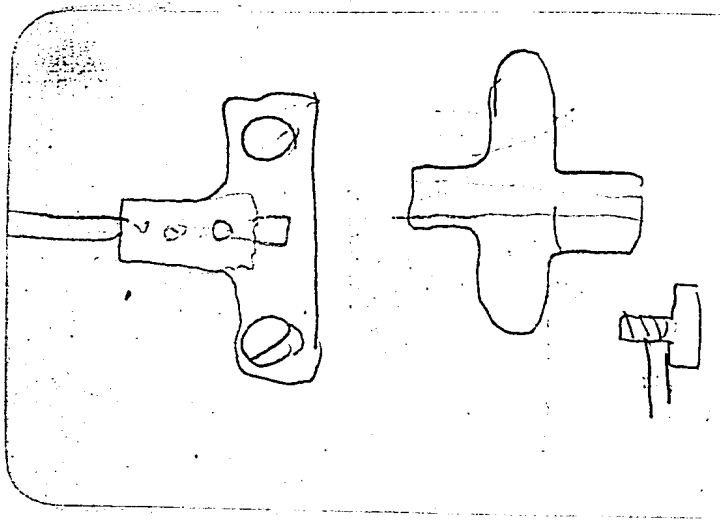
1800
1200
1650
550
5,350

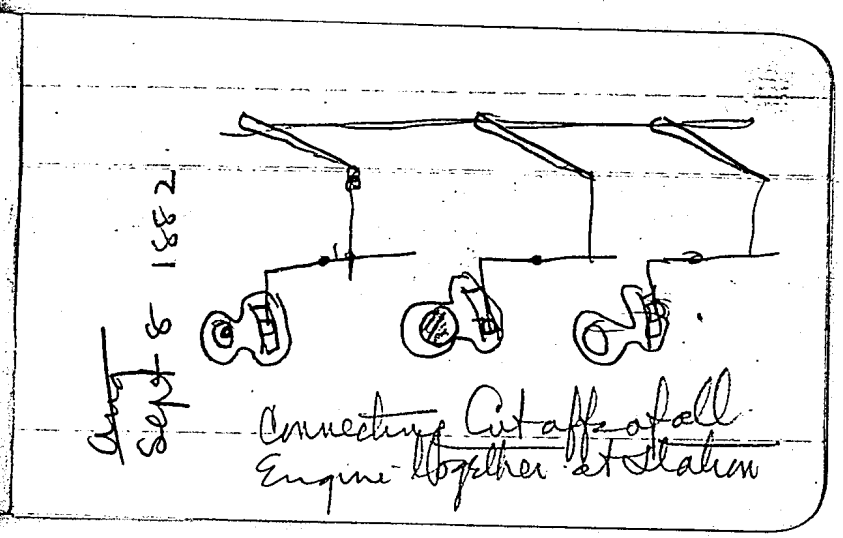
26.50
10 13.0
3

## Pocket Notebook, PN-82-09-04

This pocket notebook dates from September 1882. All of the entries are by Edison. Included are drawings of cut-offs and electrical governors for the steam engines at the Pearl Street central station; drawings of armature windings and connections; and notes about lamps, including filament and vacuum experiments. There are also miscellaneous notes by Edison to himself relating to the electric light; miscellaneous calculations; and a note to Miller F. Moore about an isolated plant at Jas. Aikman and Company. The pages are unnumbered. Approximately 50 pages have been used. Several pages have been torn out of the book.

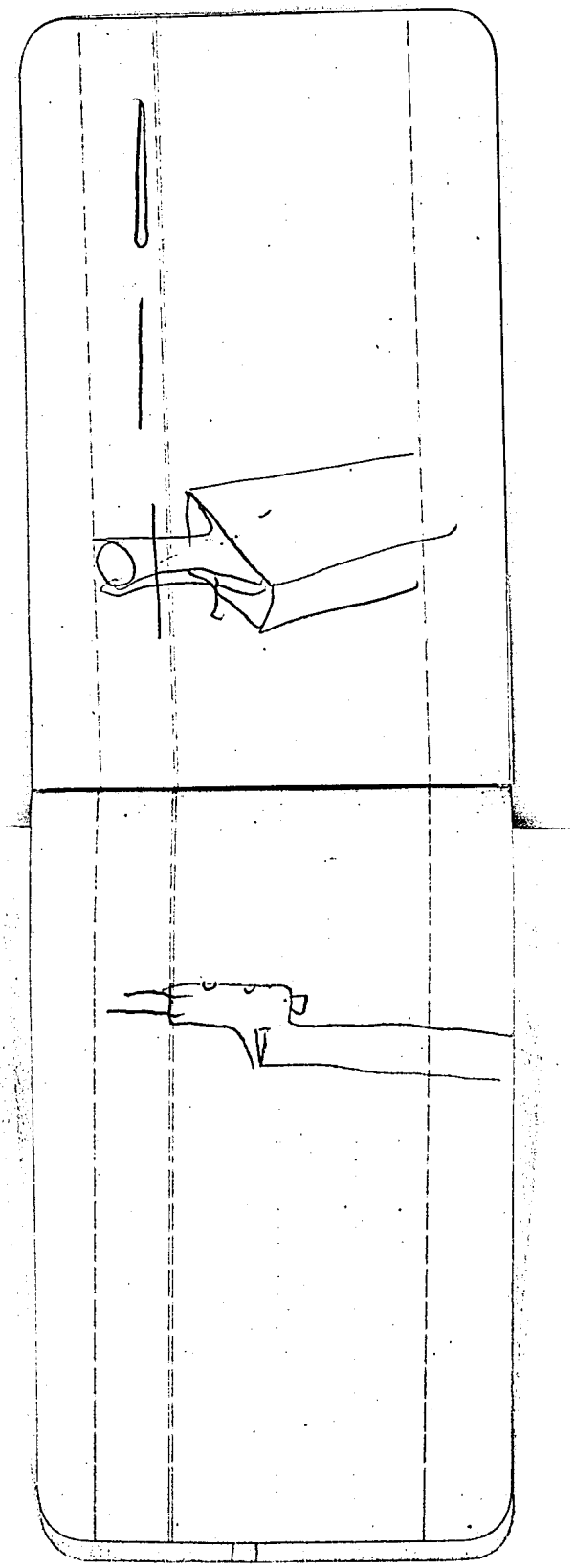

60 Lights. —
2 —
25
14
25
70
28
0
35
3000
600
105.000
600
1
3525.000
5.25
275
600
105.00
175
35
5
175.
6
5
14
3000.
3000
35
420.
6
210.
oil
210 power
175 Lamps
10 oil well
200 deep
4 Brushes
2000.
399
200
PN-82-09-04



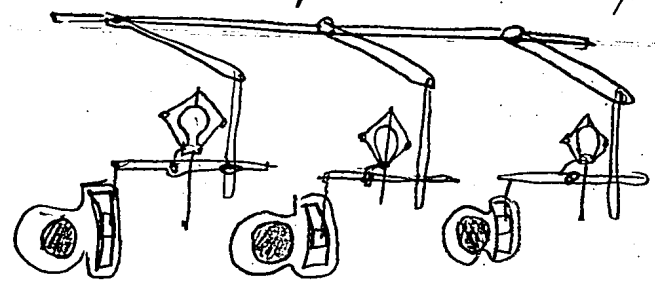


Sept 6 1882

Connecting Cut-off-of all Engine together at Station



Sept 8 1882

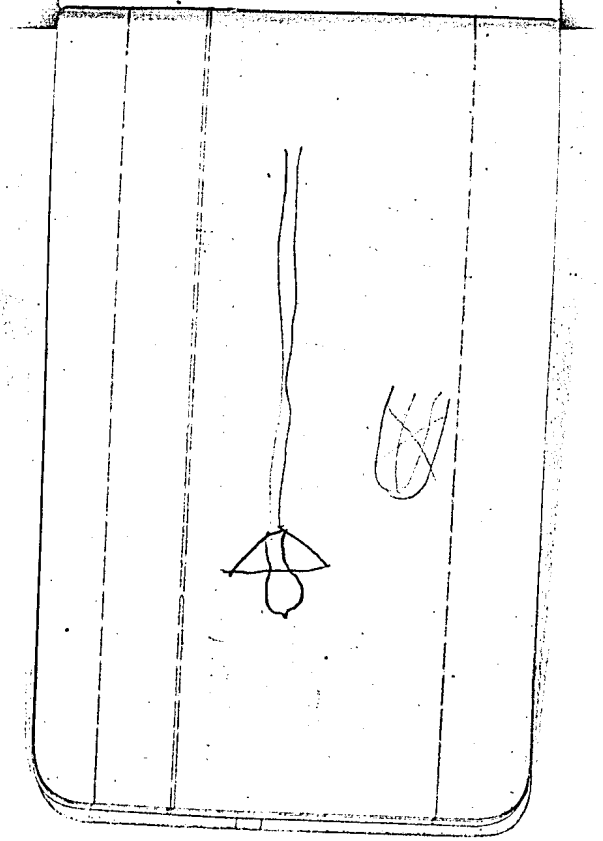


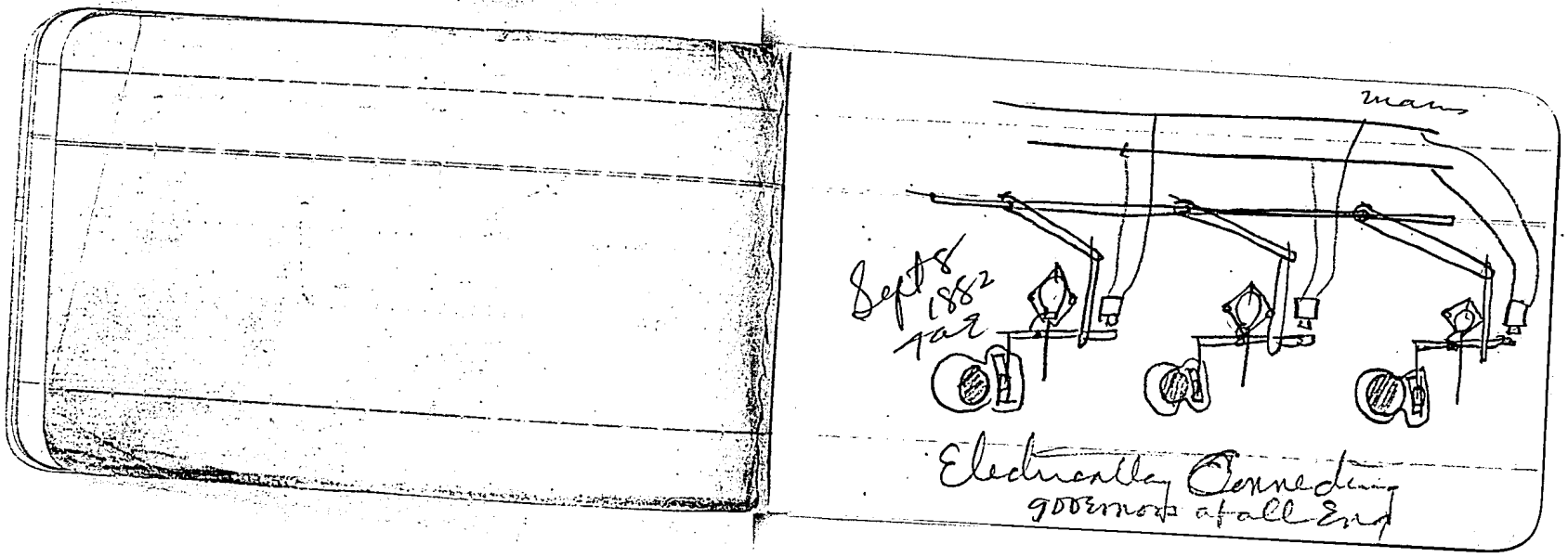
governing or connecting all the governors together

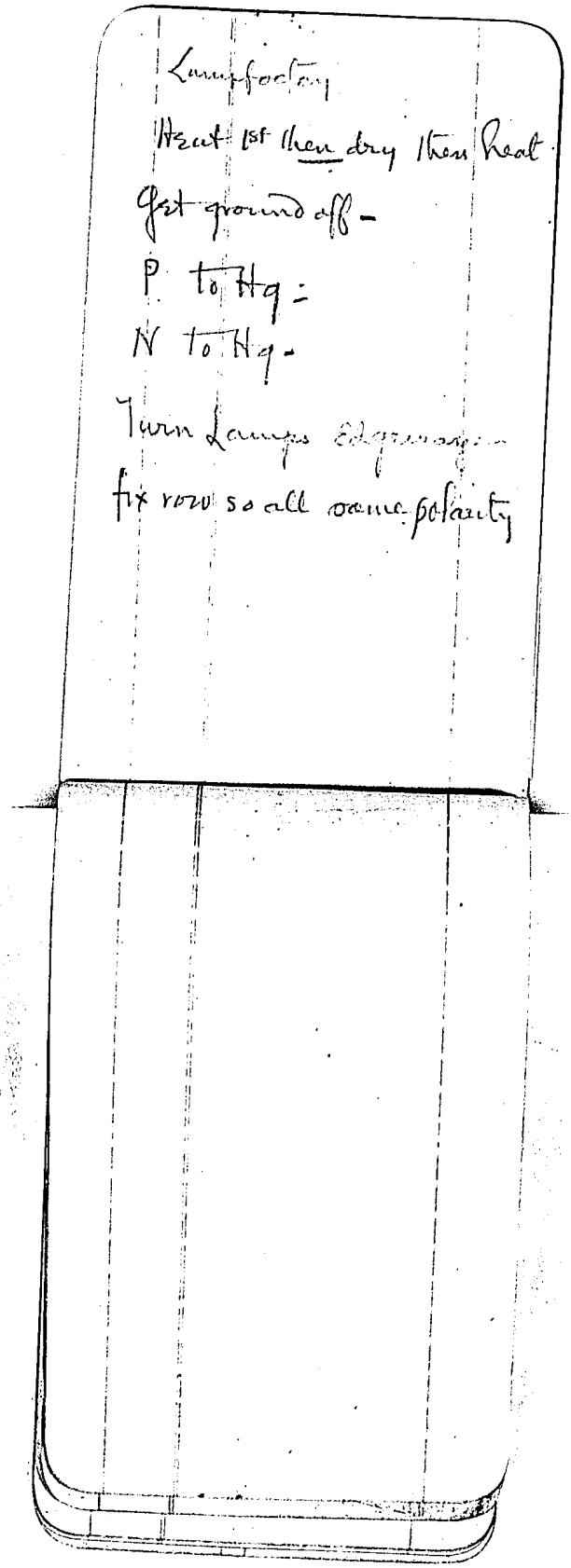
Moore.

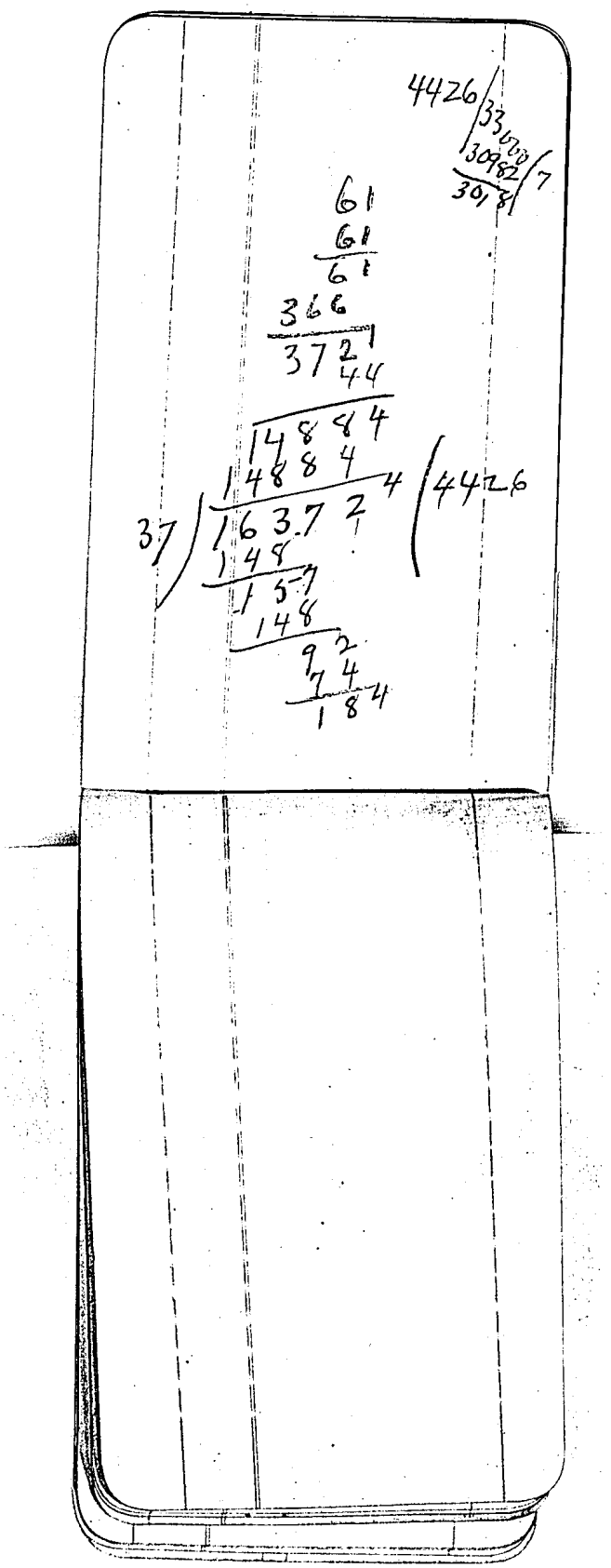
Please send man to Gas Aikman & Co Newark to estimate Cost wiring & putting 60 Light machines & told him that wud cost 2000. he furnishes power — They want Electric Soldering irons, Insull

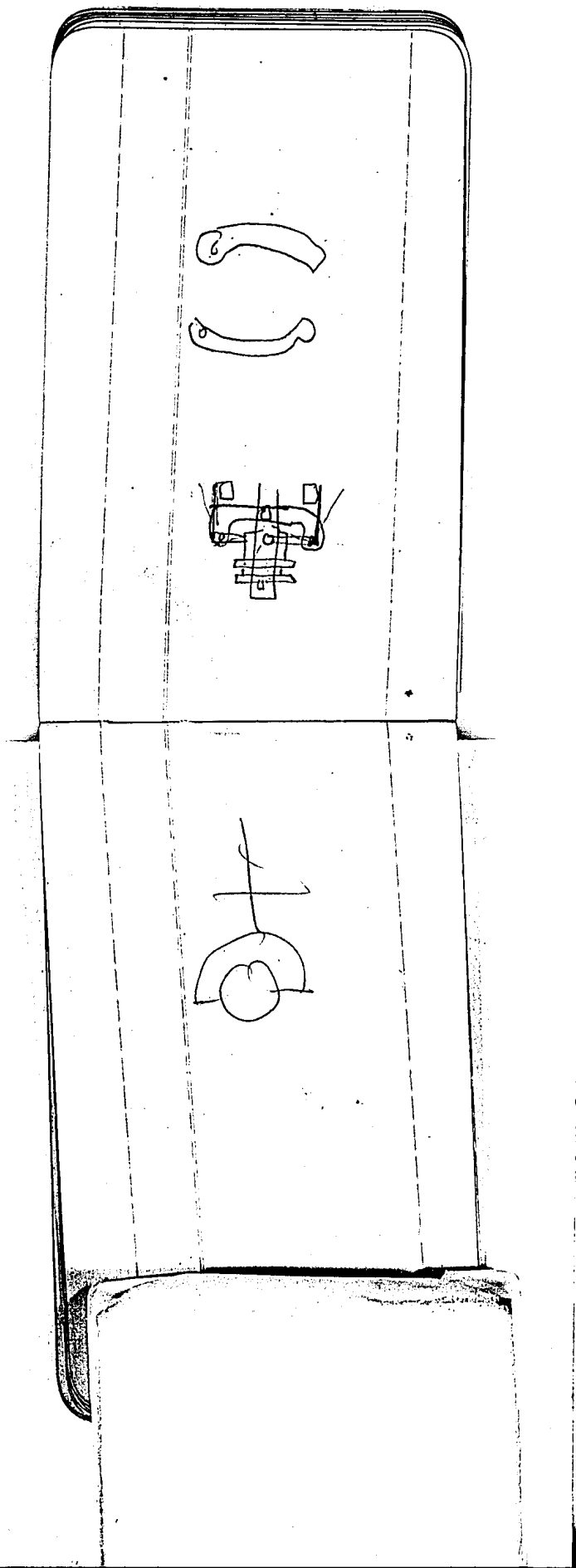
next week - go to store see Mr A - 25 - cliff street 10 am.




Main
Sept 8
1882
1 ar
Electrically Connecting
Governors at all End


Lampfactory
Heat 1st then dry then Heat
Get ground off -
P to Hg :
N to Hg -
Turn Lamps Edgeways
fix rows so all same polarity


4426/33
30982/7
301
61
61
6
366
372
44
1484
1484
4
37/16372/4426
148
157
148
92
74
184



22

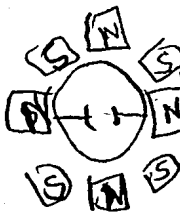
22

17-

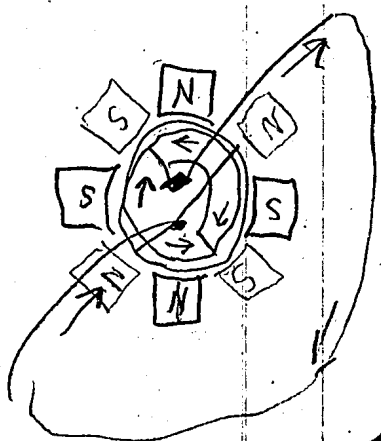
5 48
15
48
20
30
40
20
221

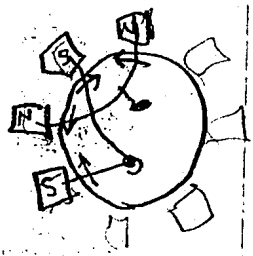
12 | 221 | 18
12
101

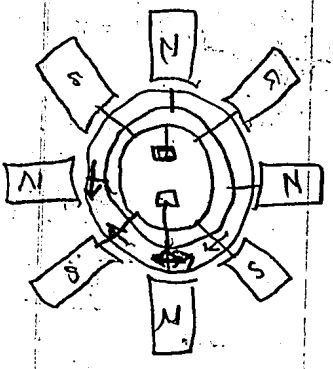
26. | 350 | 94
234
116
104




40 | 250 (






4000

26 / 3 / 78 / 350 / 390.0

16000 / 24.

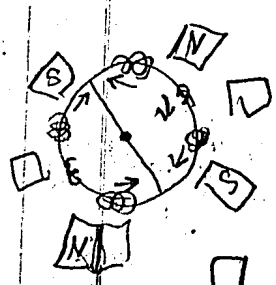
234 / 2730.

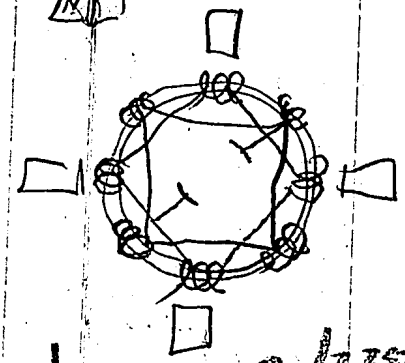
35 / 3 / 105 / 210 / 525.0

3600 / 20000 / 18000 / 2000

525.0 / 210 / 315.0

36 / 105 / 210 / 315.0 / 216 / 27000



12 | 27090 | 225R
24
32
60
12

40
3
120
250
6000
240
30000

12 | 3000 | 25
24
60

27 | 2400 | 8
216
24

240 | 2400 | 10
2400
3000

42
3
126
250
6300
12 ) 25200 ( 2625'
24
12
0
24
60

2625' ft 42 dia

26
3
78
250
390
12 ) 156 ( 13
12
36
36
00

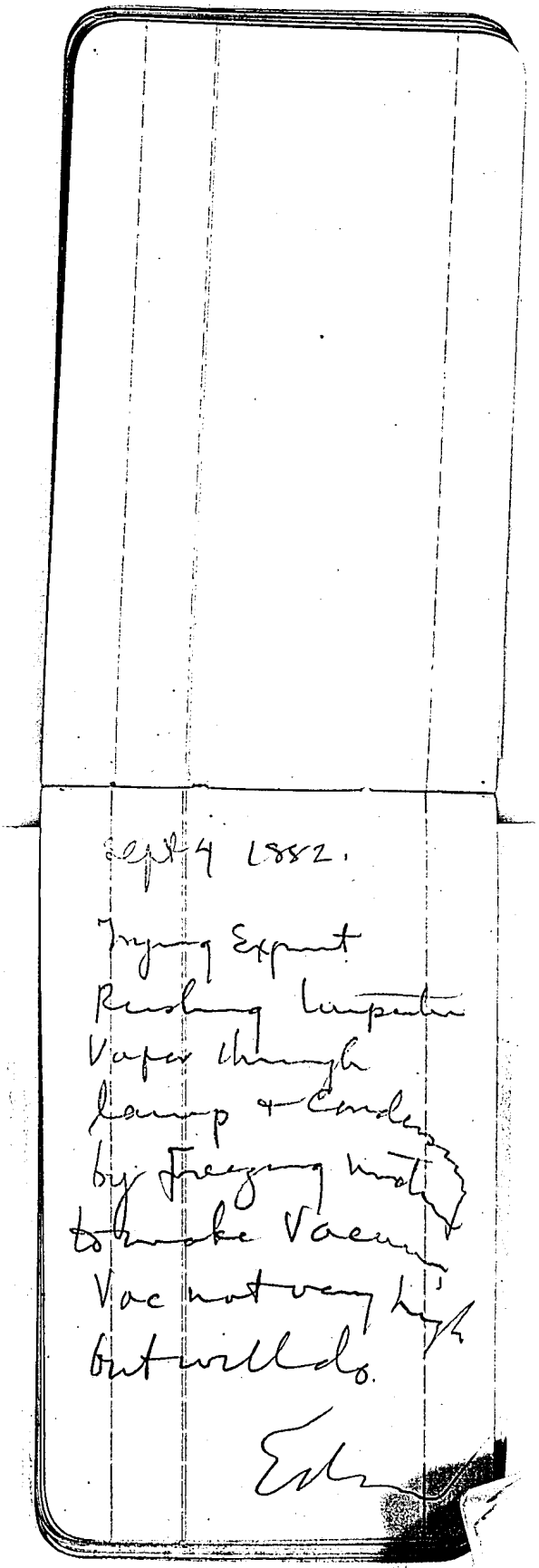
1400 ) 2625' ( 1.8
1400
1250
1200
11200
10500
2340
12 ) 2730 ( 227.5
24
33
24
90
84
60

78
350
390

2625'
1800
825
750
75

2275' 2400

1200 ) 2275' ( 1.9
1200
10750
10800

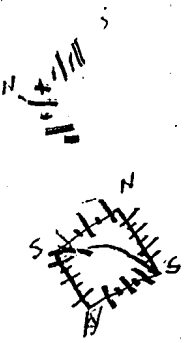


Sept 4 1882.

Trying Experiment
Passing temperature
Vapor through
lamp & Condenser
by freezing mixture
to make Vacuum
Vac not very high
but will do.

Edison

80
20




26.

12 feet long.

11.

54
2
108

26
3
78.

30
3
90.

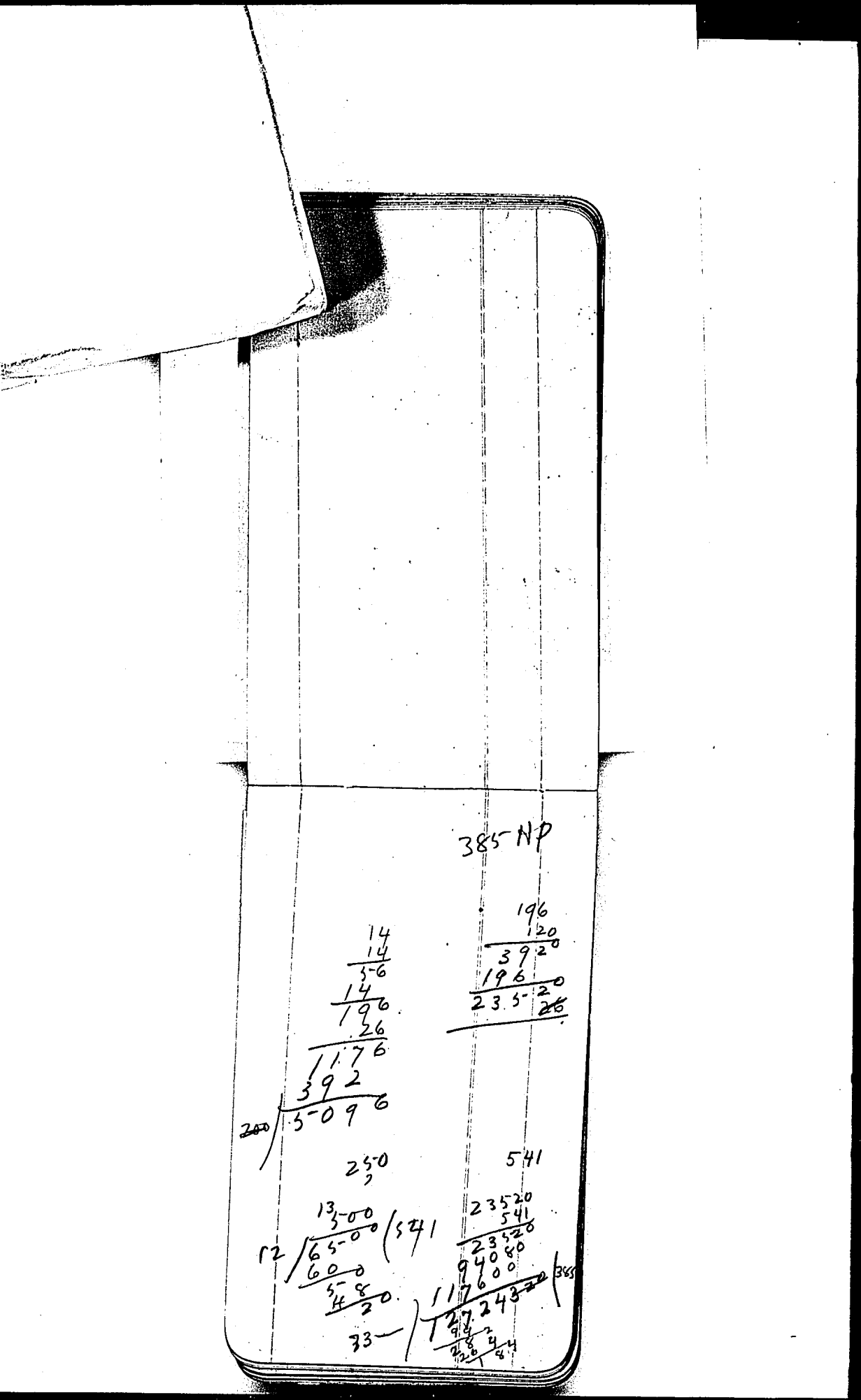
9-

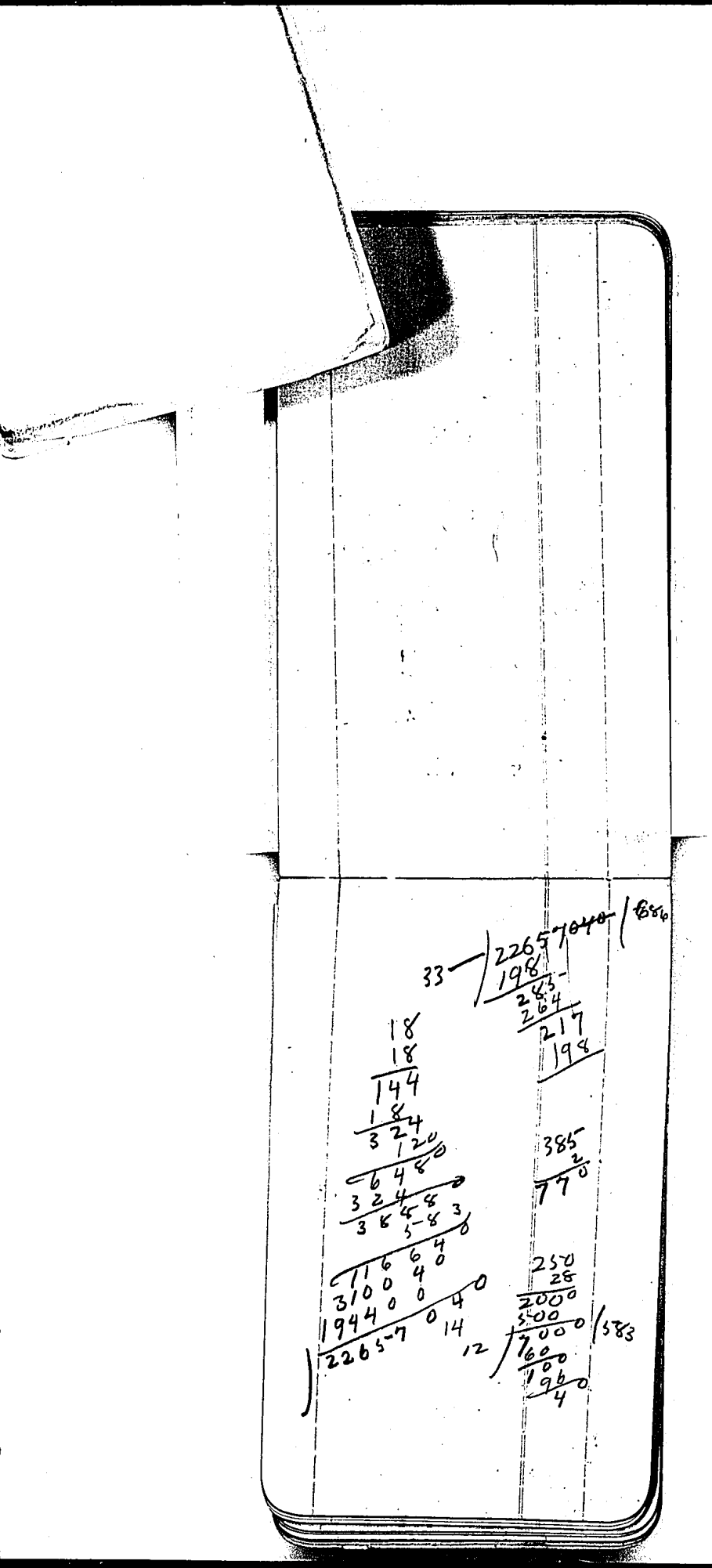
50
3
150.

24.

40
3
120.

4


385 NP
196
120
392
196
235-20
26
14
14
5-6
14
196
26
1176
392
5-096
200
25-0
13-00
5-00
65-00
60
5-8
4
20
33
12
541
235-20
541
23520
94080
9400
117600
27243
385



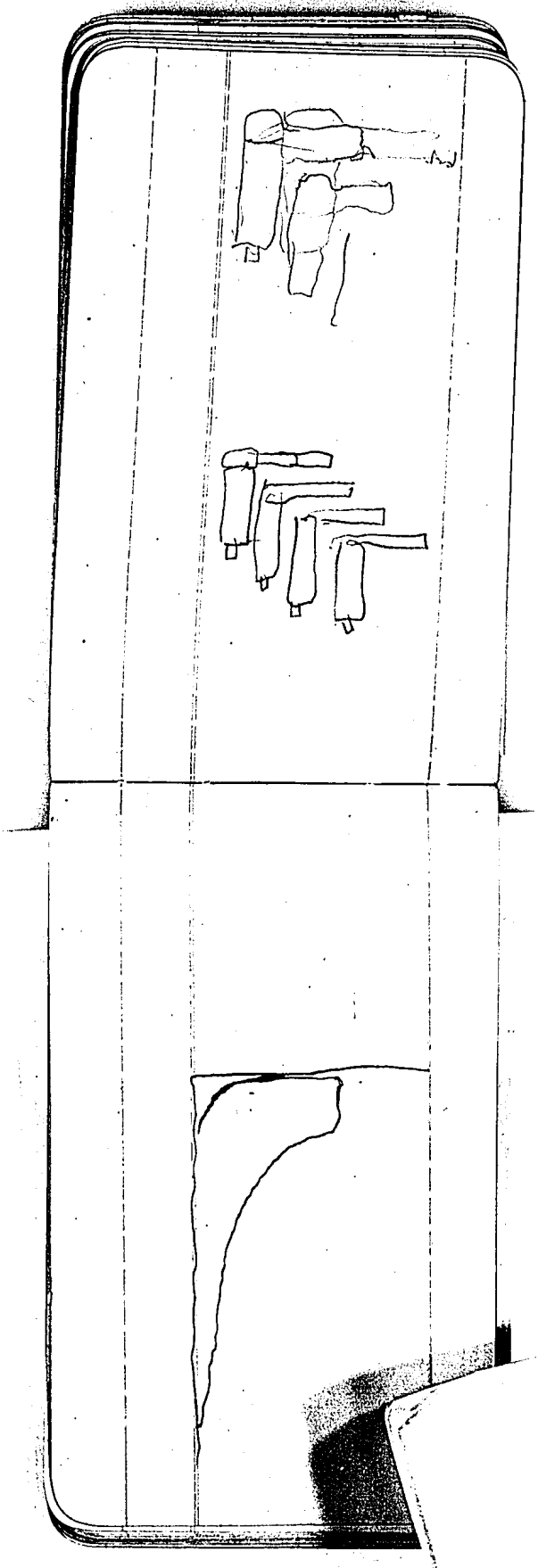
8 45000
1200
9000000
45000
540000000

12
100
1200

4500 | 540000000 | 120000
4500
9000
9000
0

16 | 12000 | 750
142
80
80
0

440 | 750 | 1.7
440
310



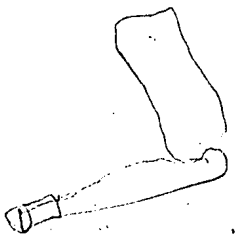
64

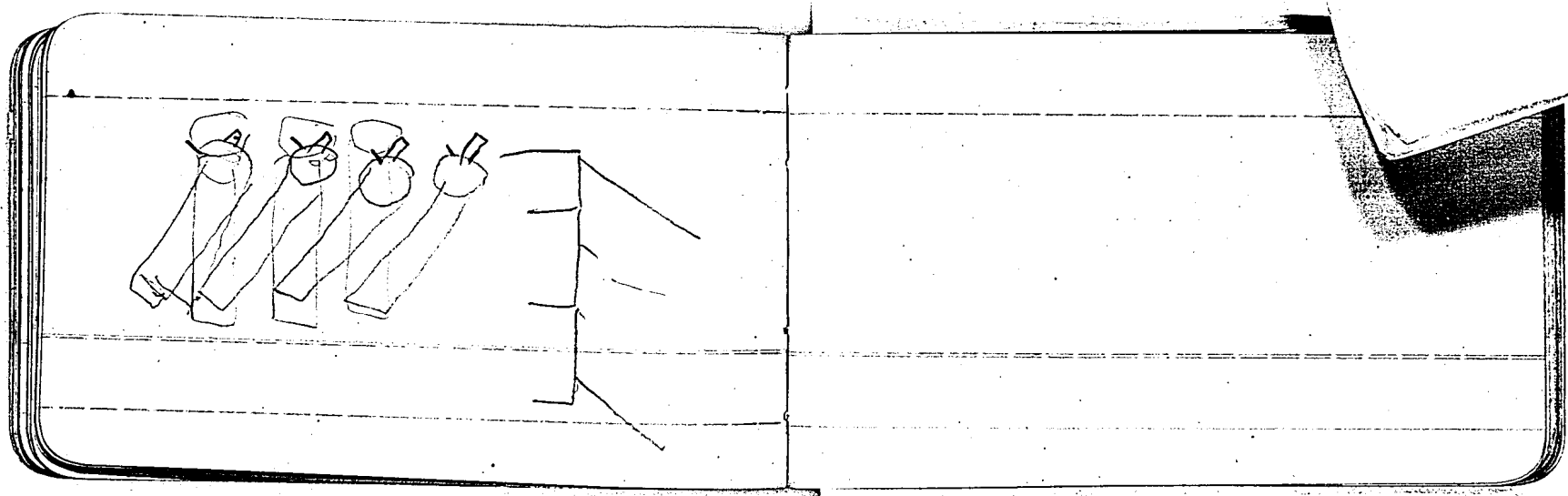
100.

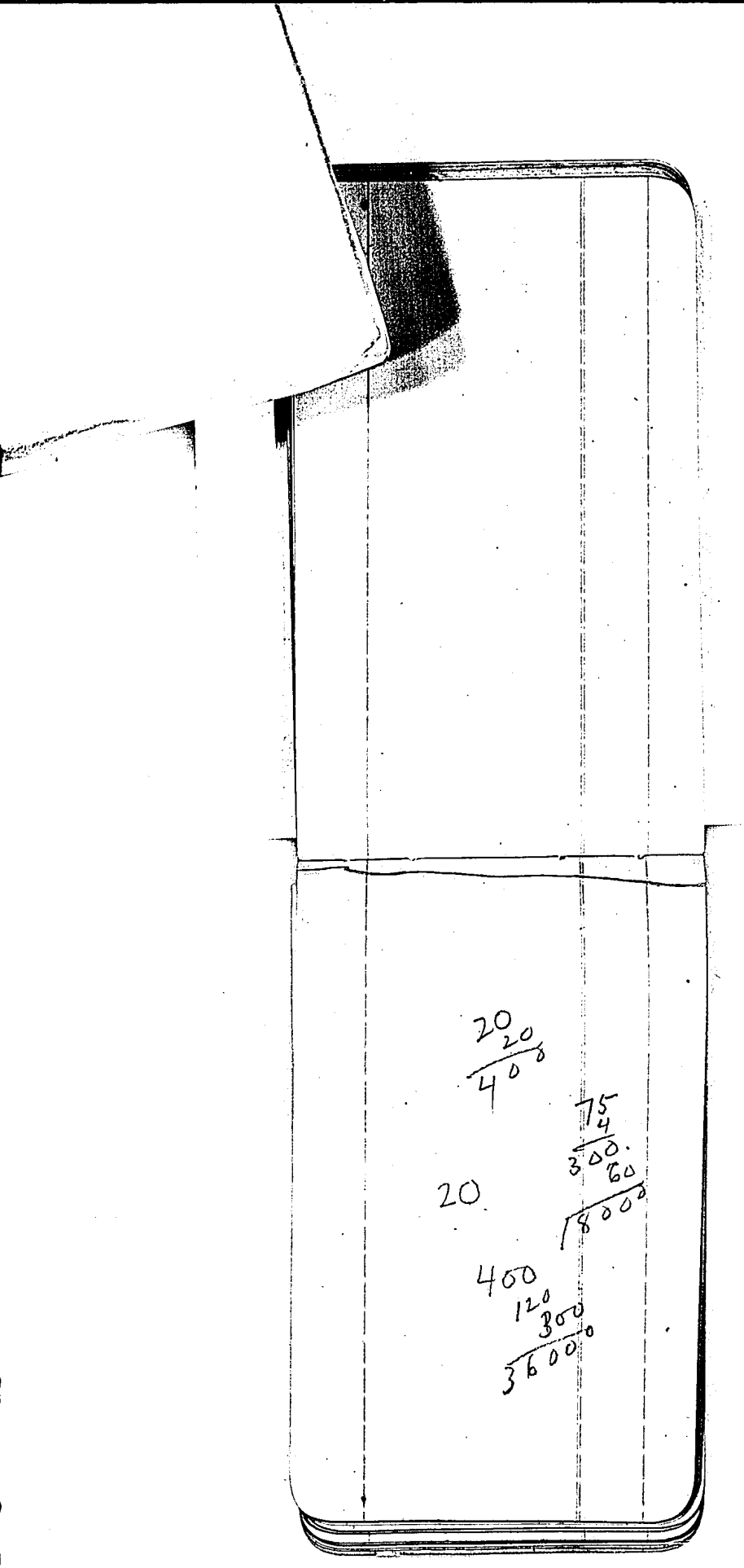
5000
5000
2 | 2,500,0000
1.250.000

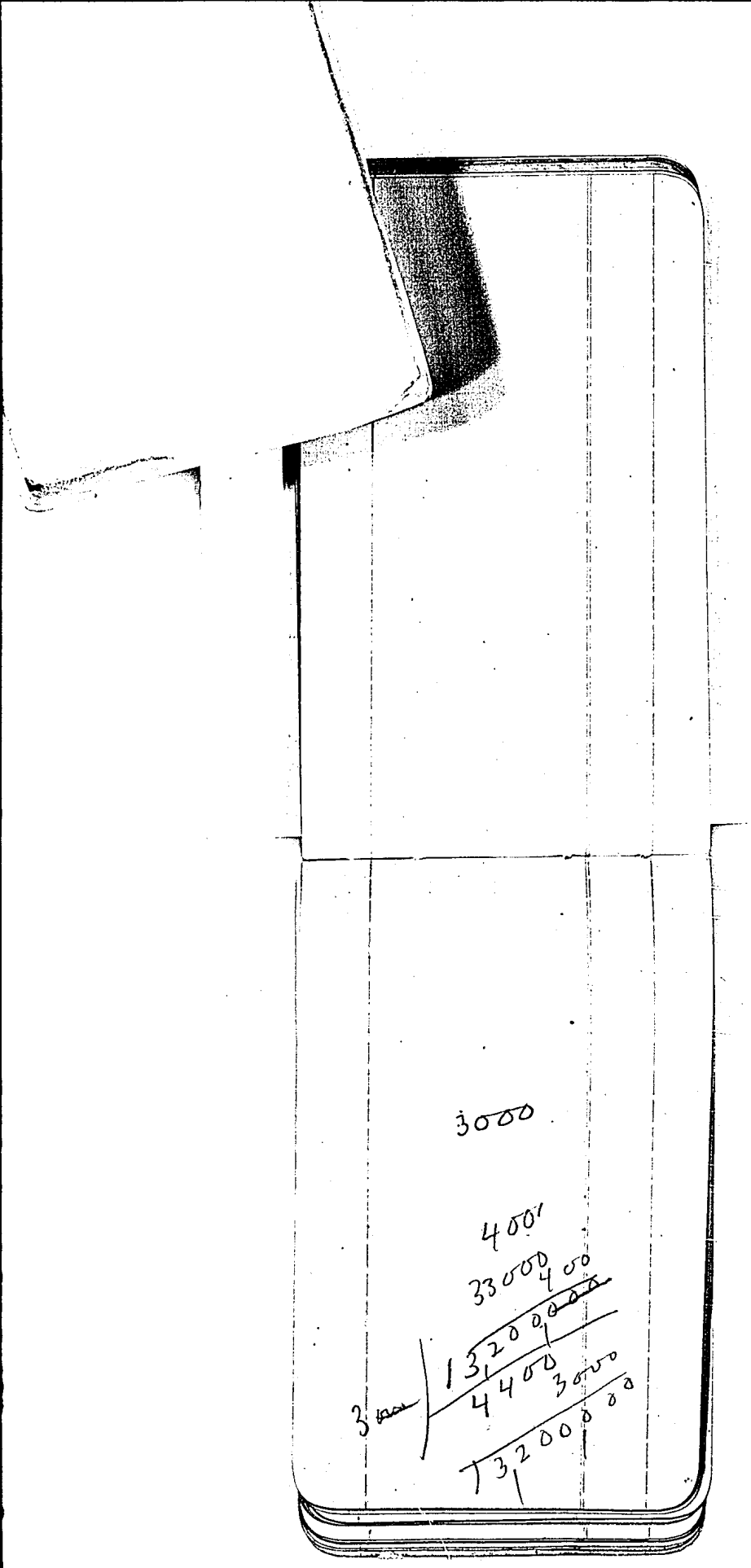
100
100
10,000

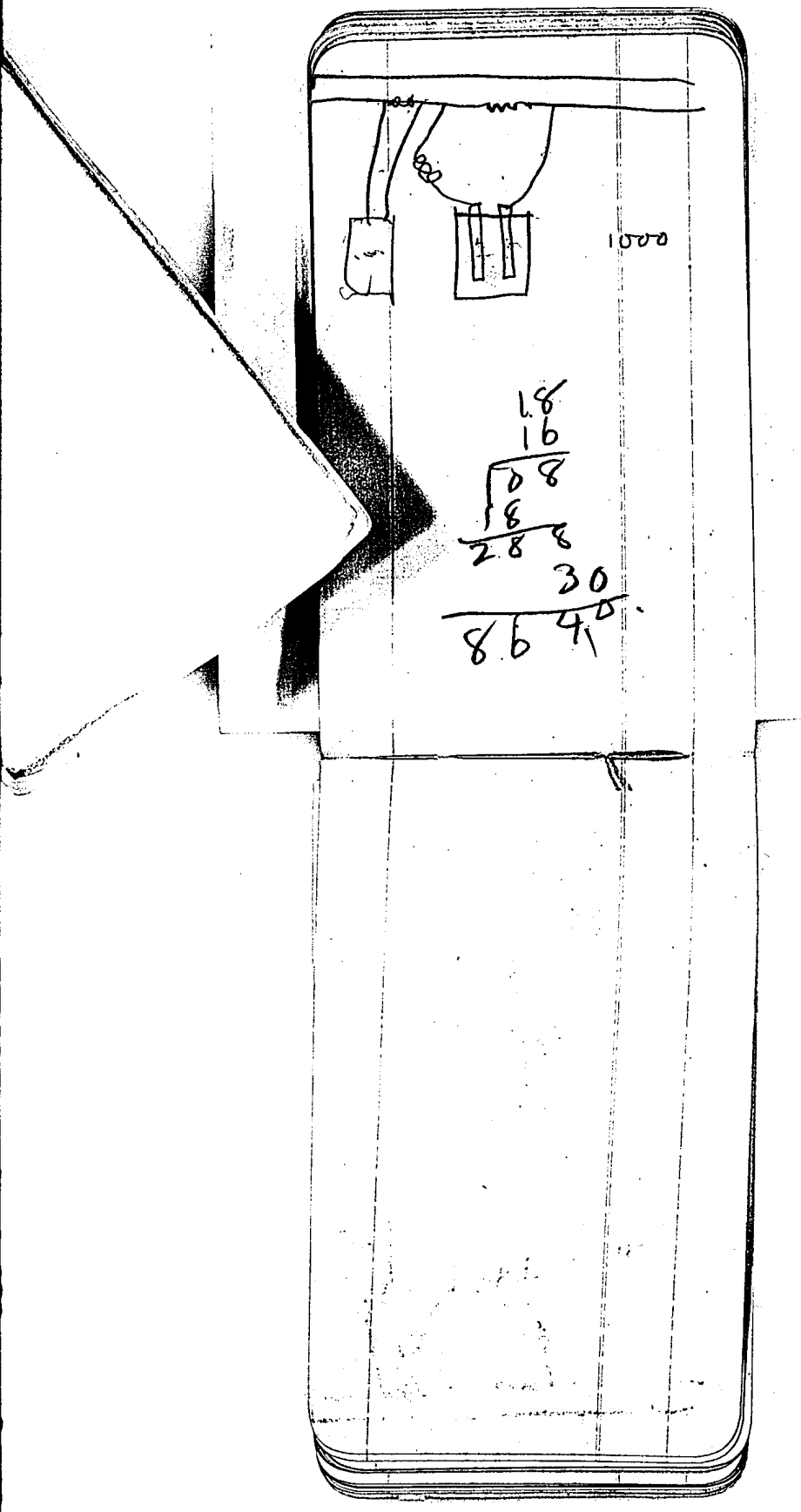
1250000
10000
12500,000,000

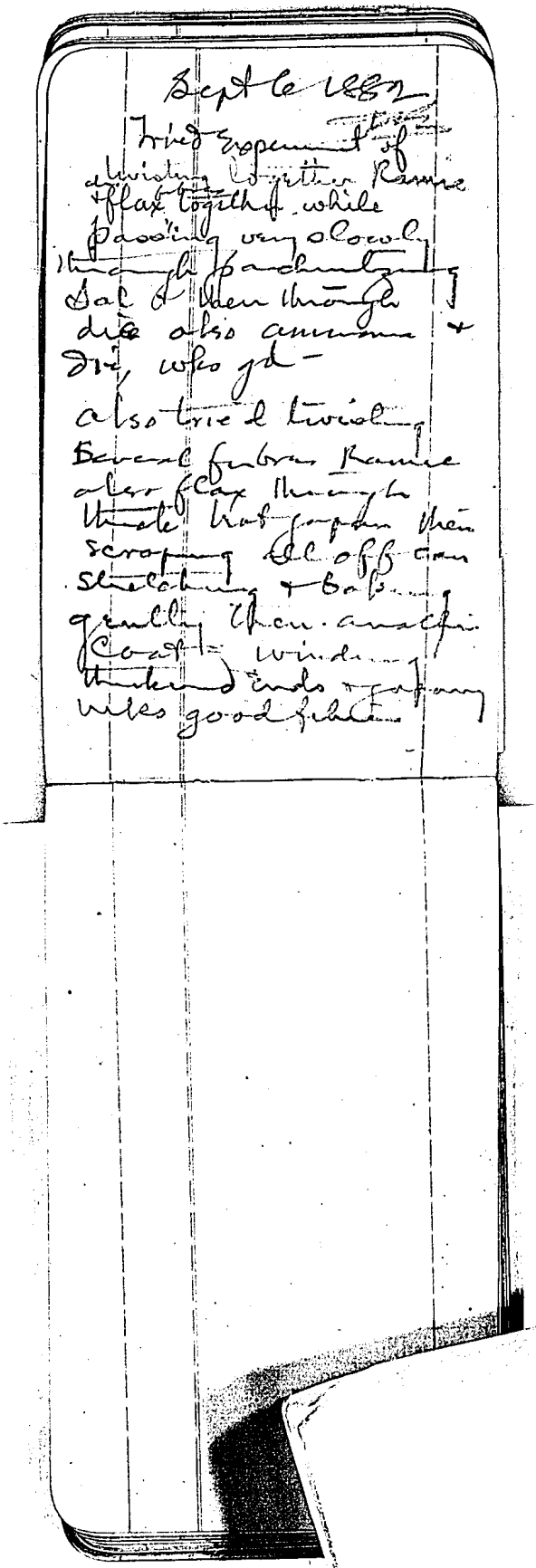





20
20
400
75
4
300.
60
20
8000
400
120
300
36000


3000
400
33000
4000
3 | 132000
4400
30000
32000000
32

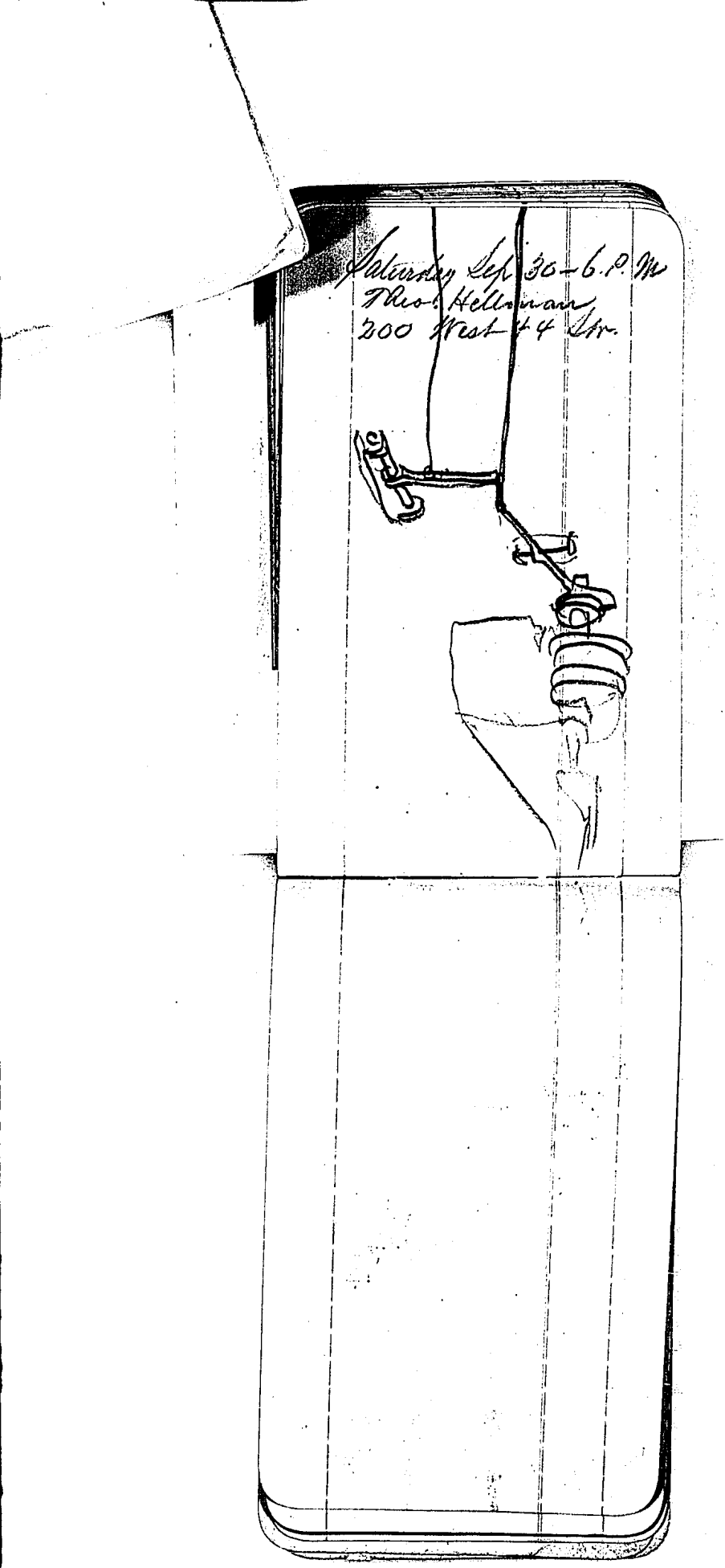

1000
16
16
08
18
288
30
864
40

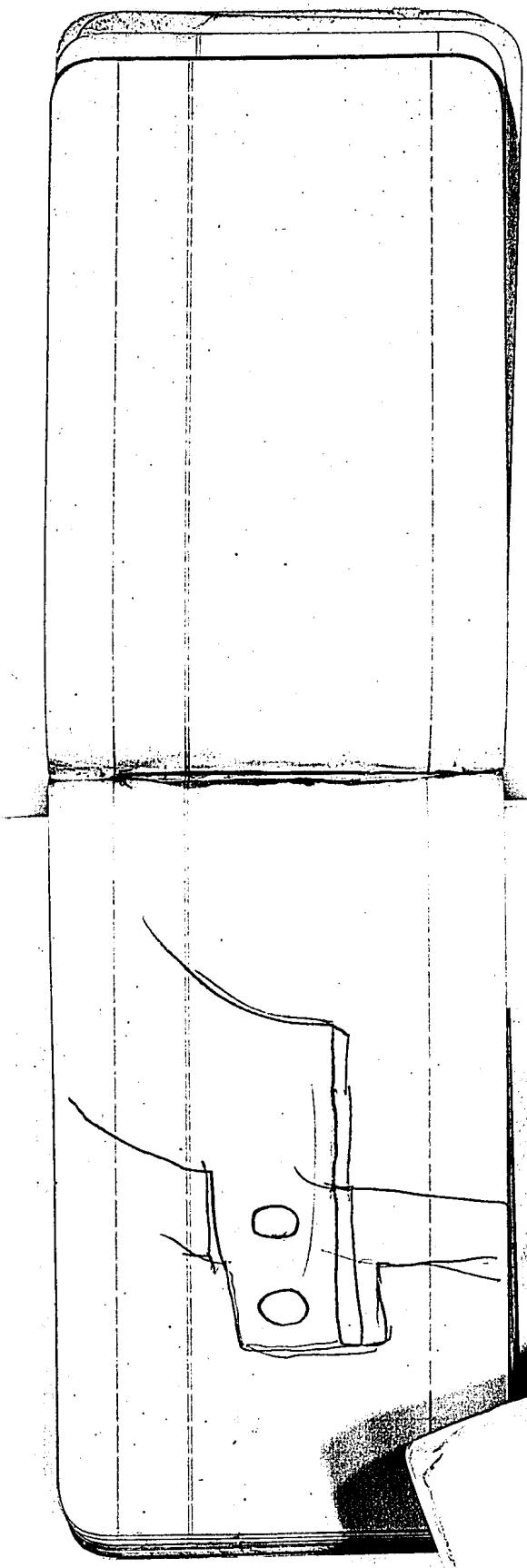


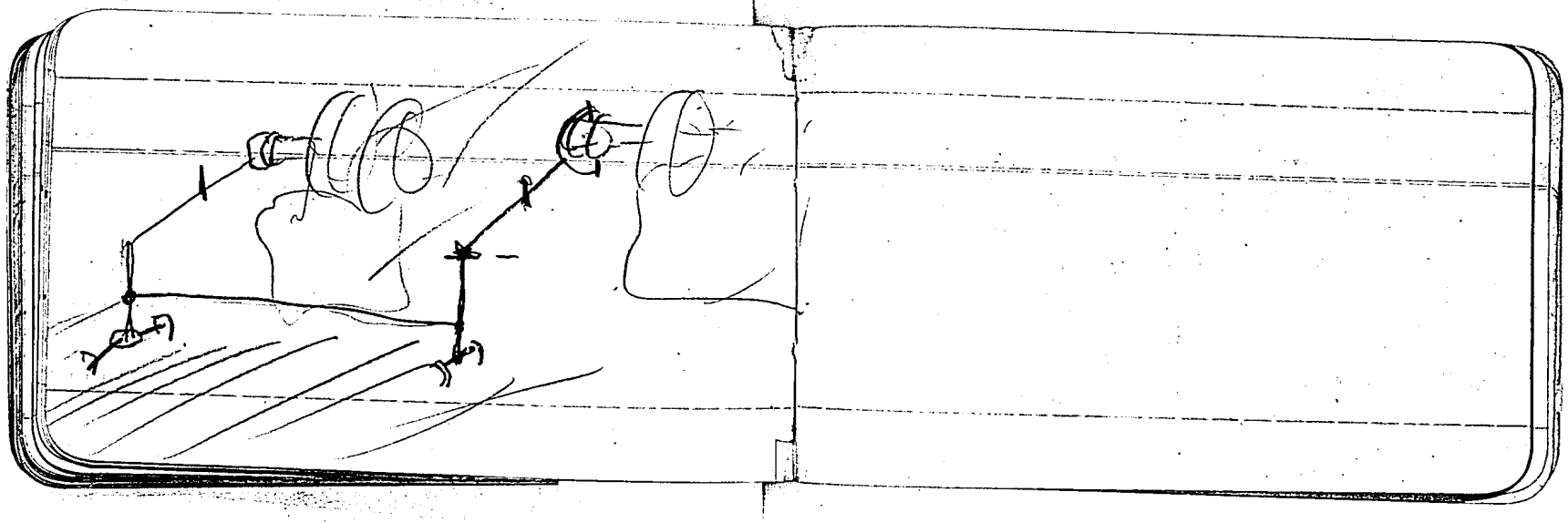
Sept 6 1887

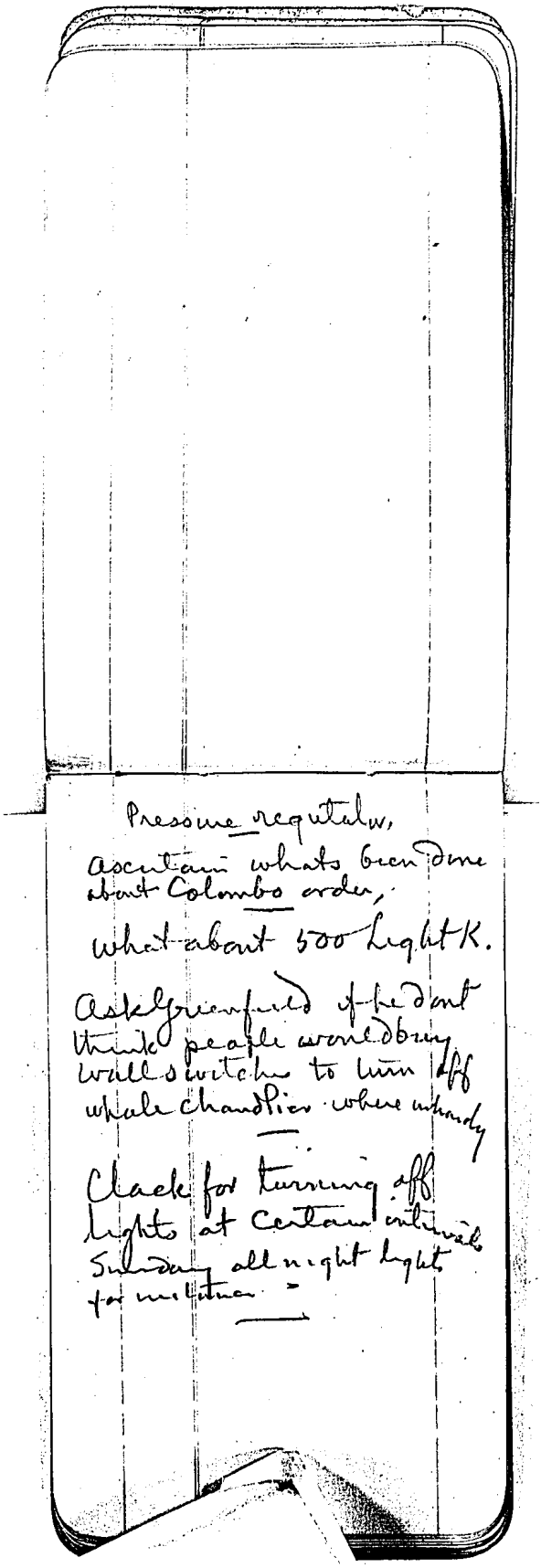
Tried Experiment of twisting together Ramie & flax together while passing very close through [illegible] Sat & then through dies also ammonia & dry, when yd—

also tried twisting Ramie alone & flax through water & let soak then scraping & all off com- -ing & bat- - - gently then ammonia Coast = wind- - - thunderstorms & fog many miles good fishing


Saturday Sept 30 – 6. P. M
Thos. Hellman
200 West 44 St.



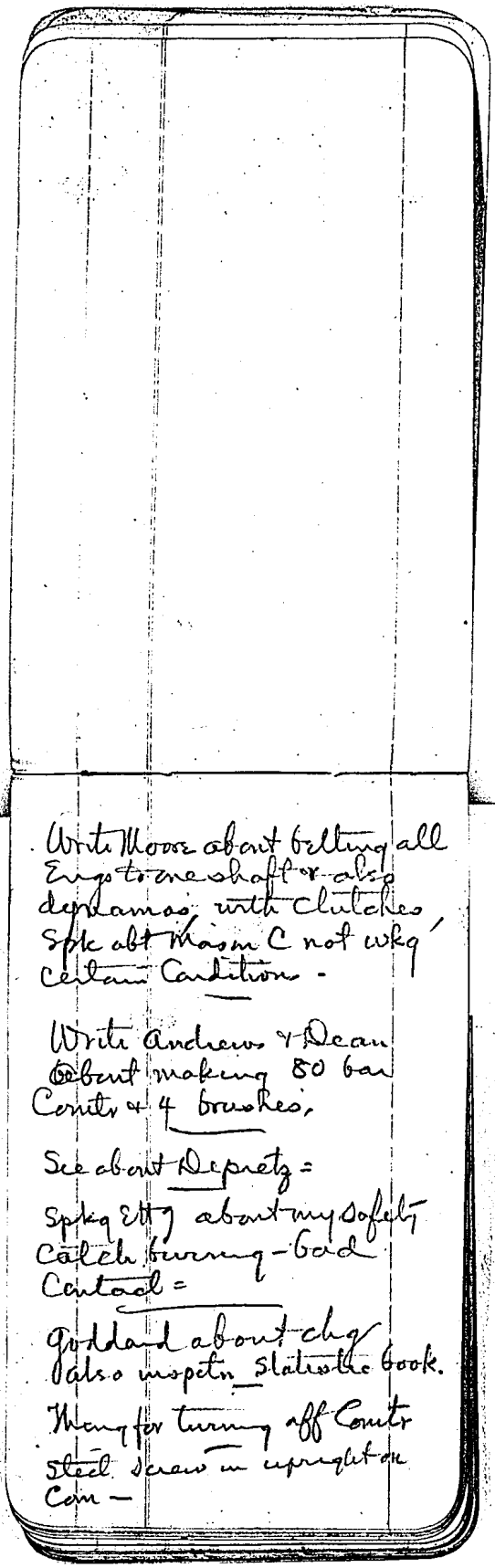




Pressure regulator,
ascertain what's been done
about Colombo order,
what about 500 light K.

Ask Griesfield if he don't
think people would buy
wall switches to turn off
whole chandelier where handy

Clock for turning off
lights at certain intervals
Sunday all night light
for mistress



Write Moore about belting all
Engs to one shaft or also
dep[end]ants with Clutches,
Spk abt Mason C not wkg
Certain Condition -

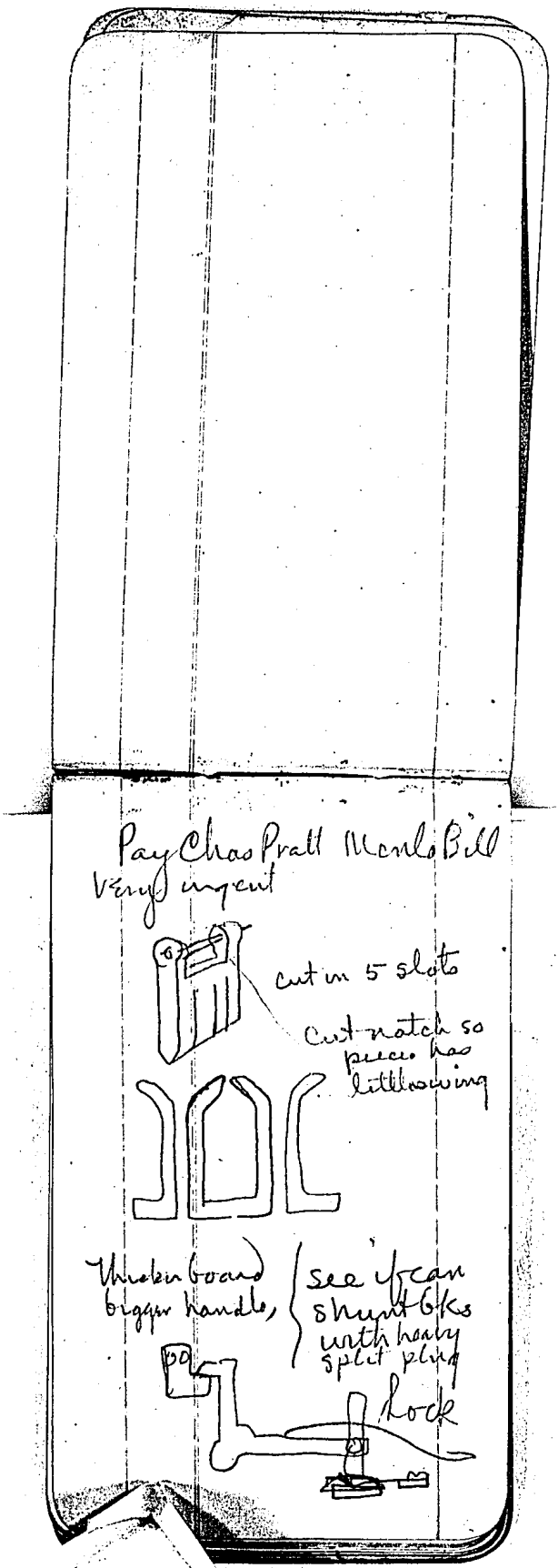
Write Andrews & Dean
about making 80 bar
Comtr & 4 brushes.

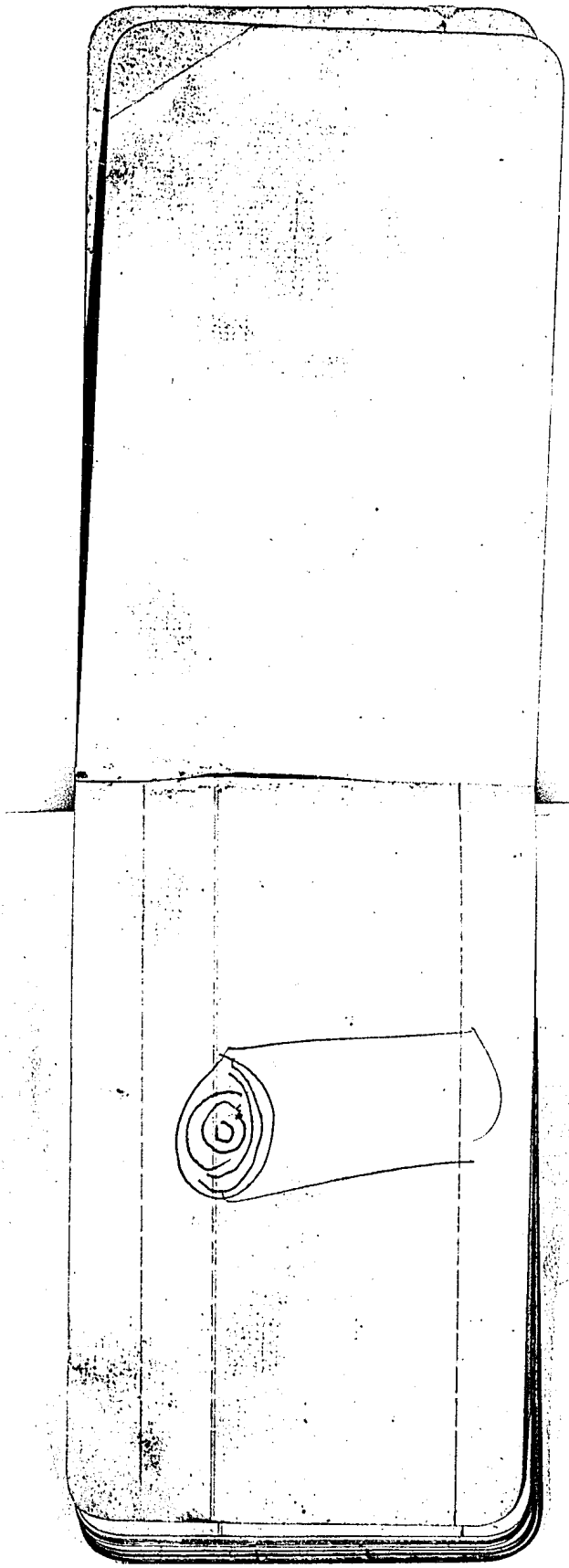
See about Depretz =

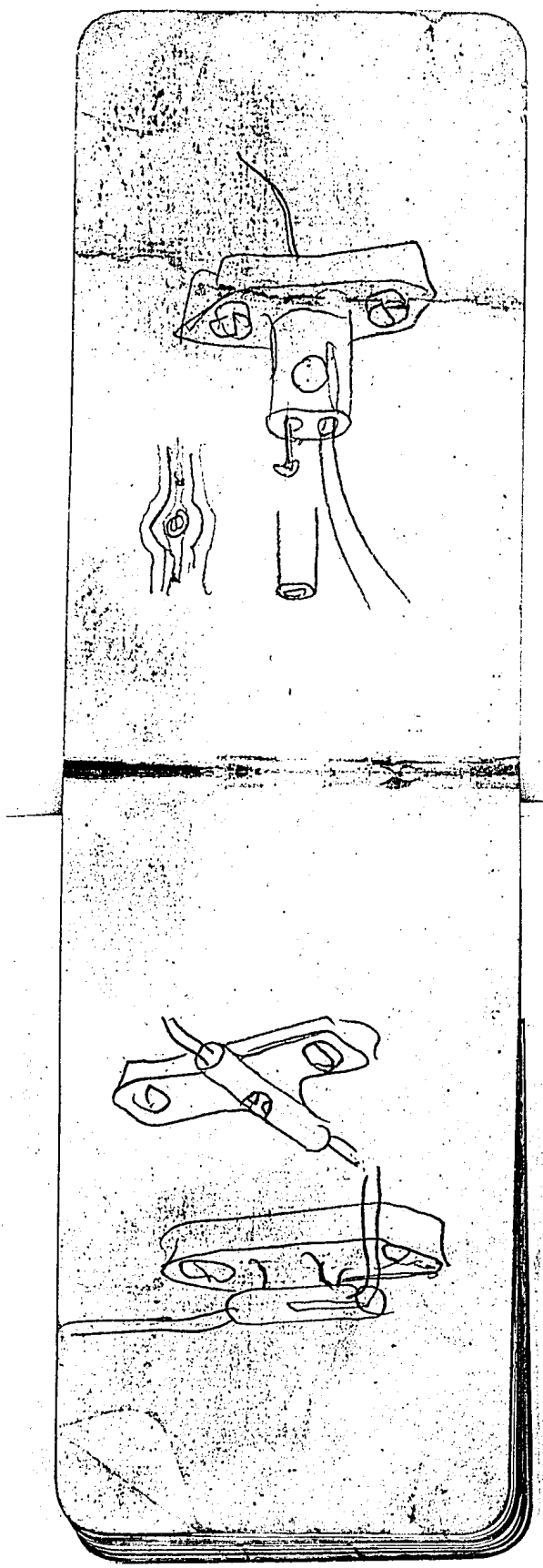
Spkg Ettg about my Safety
Catch burning - bad
Contact =

Goddard about chg
also inspctn Slate to the Book.

Mang for turning off Comtr
Steel screw in upright on
Com -


Pay Chas Pratt Menlo Bill
Very ingenuit
cut in 5 slots
Cut notch so piece has little swing
Thicken board bigger handle,
see if can shunt 6Ks with heavy split pins
Lock





## Pocket Notebook, PN-82-00-00.1

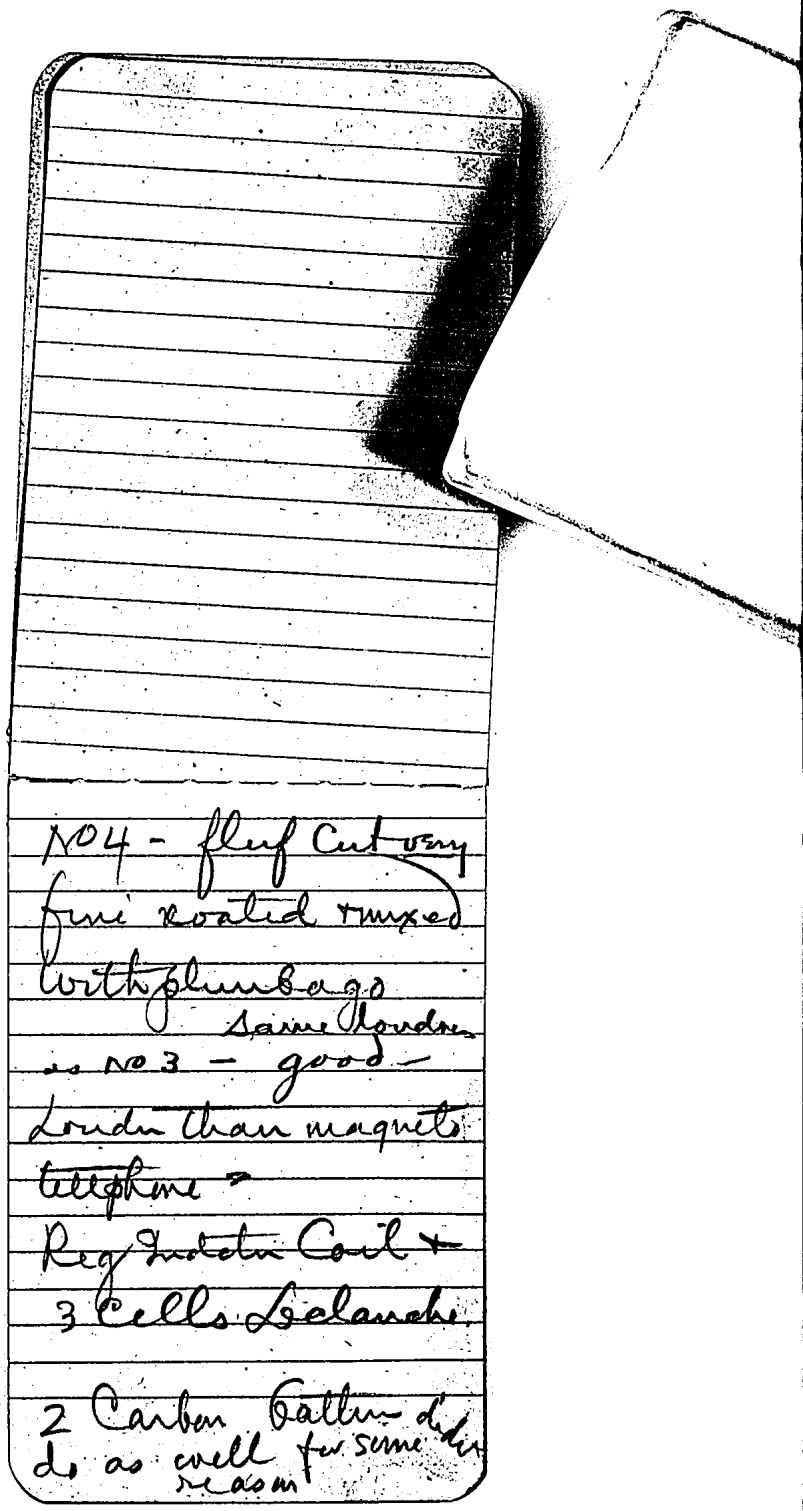
This pocket notebook is undated but was probably used in 1882. All of the entries are by Edison and consist of notes relating to carbon buttons for telephones. The front cover is labeled "English Telephone Suit Transmitters." The pages are unnumbered. Only 10 pages have been used.

#574 Shelf 6 Box 3

No 1 has silk coated with plumbago - and with plumbago between = good

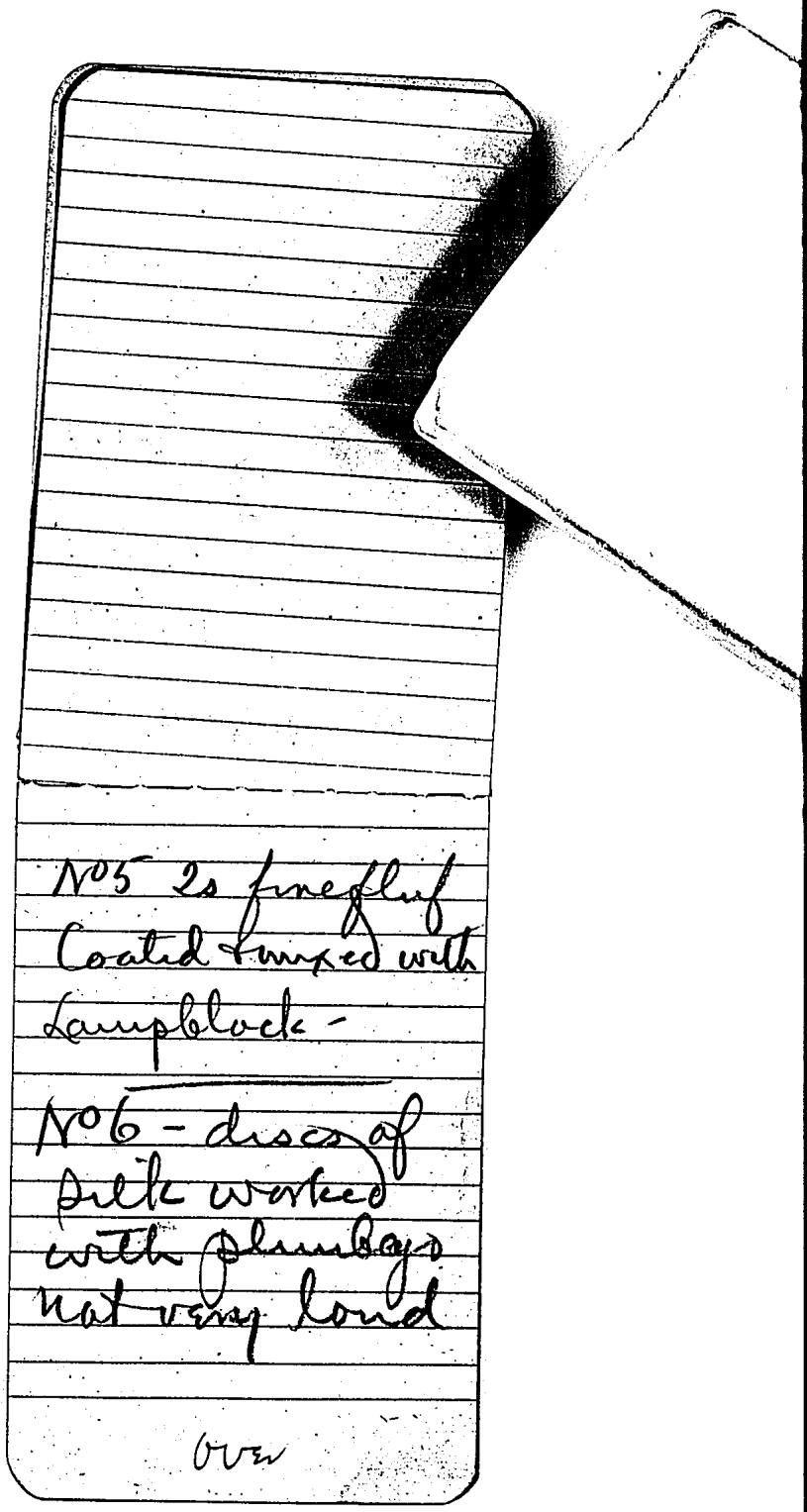
No 2 Silk cut fine Coated with & mixed with plumbago - better -

No 3 Silk Coated & Cut fine mixed with slight amount plumbago - Bergman says about as loud as medium Carbon transmitter better than Nos 1 & 2



No 4 - fluf Cut very
fine coated mixed
with plumbago
Same Powder
as No 3 - good -
Louder than magnets
telephone -
Reg Induction Coil +
3 Cells Delaneke.

2 Carbon Battery do
do as well for some
reason



No 5 2s fine fluf
Coated twice with
Lampblack -

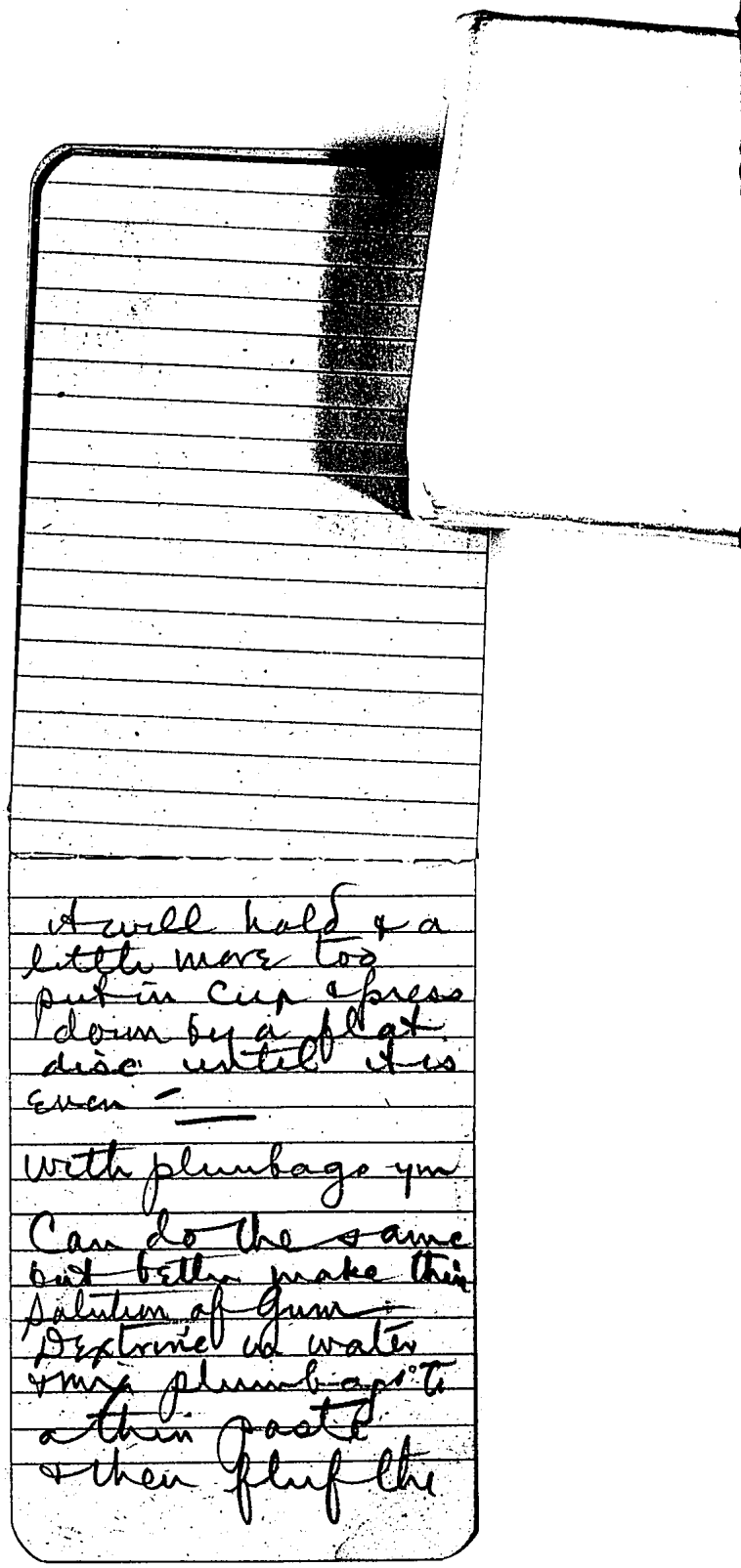
No 6 - disc of
silk worked
with plumbago
not very loud

over

To make fluf

get some raw silk
untwisted tangle
up a lot & pull it
so it will be all fluffy

then take some carbon
buttons powder up &
thoroughly mixed
then take pair shears
& Cut it up in ½ inch
lengths after Cut up
prick & work all
the lamp black



it will hold a little more too put in cup & press down by a flat disc until it is even —

With plumbago you Can do the same but better make thin solution of Gum Dextrine & water & mix plumbago to a thin paste & then fluff the

Sick & work
mushy stuff on it
then pull it out
so there is no lumps
& let it dry for
several hours
then twist it up
& cut in 100 of
each lengths so it
will be a fine
fuzz - then work
powdered plumbs
into it as much

so it will hold
then put in holder
+ work it flat
by gently pushing
a flat piece of
on it) =

The silk disc
are not loud as
we didn't have

time to work the plumbago in it should be worked with a mushy bit of plumbago & dextrine a prick through so as to get plumbago the fibre - then it allowed to dry

then rub over another Coat without pricking rubbing in both sides, then dry afterwards rub another Coat. the more Coats the louder -

all these
telephones are
a little louder
than Mary

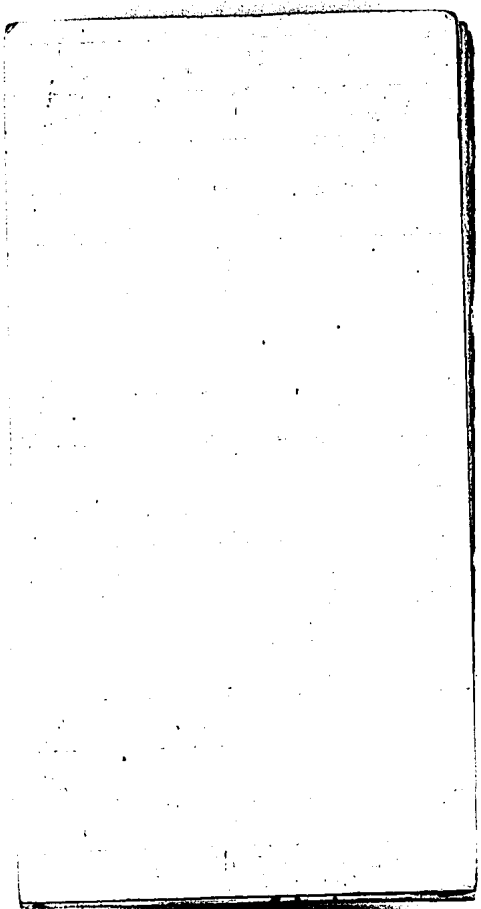
## Pocket Notebook, PN-84-02-25

This pocket notebook covers the period February-March 1884. All of the entries are by Edison. Many of the notes and drawings relate to the carbonization of lamp filaments and the production of nitro-cellulose filaments. There is also material pertaining to multiple telegraphs, telephones, batteries, and artificial mica. The cover of the book is missing, and the pages are unnumbered. Approximately 50 pages have been used. Several pages have been torn out of the book.

"West Orange — Lat — Notes" D 1884 (1884)

Geo S Youngberg
Box 86 Jeffn Ohio

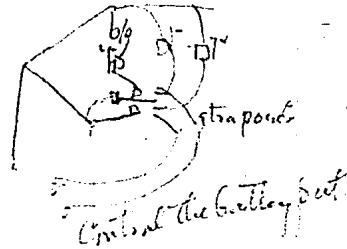
writes relative queat
want of a branding
iron that will not hurt
cattle - Etc - Nitrate Silver
states that only very simple
brand used as letters run together
& complicated brands caused
irons used great pain to
animal —



Tuesday March 5 1889
Try Gelatine mixed with
Phosphate Lime, also
phosphate ammonia
& other Alkaline phosphates
in different proportion
with view present melting
& Swelling in Carbonic acid
also Chloride Ammonia
which will volatilize
by heat, also with
Iodine & other Salts
Volatile things try
Andrews Salt in $H_2O$
mixed with Gelatine,
this analyse going off
by low red -
also try various agents
try Sulphur Crystals
with Ether

Write Hadley to
Make some fluent
of Bromber with the
outer Silica Surface
left in

Octdiple



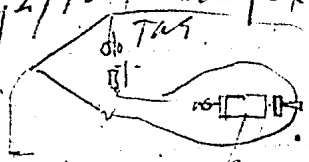

Send constant vibration to keep reed going both ends. Have 2 p/g on each side Cutting in relays - also Controlling putting on extra battery.

F/Lt 28.7.884
TAR

India inks 7 Febry 25 1884
Silvered Cotton. Oak

Gelatin impervious to $H_2O$
drawn hot upon cold.
Dep'sn between platy Co/o
get Au + Ar in mind —
Mountains black in at
Conductivity —

Febry 27/1884 Sextuplex.




blk dot for mak

It strikes me after much analysis that the future scheme for direct conversion is the placing of finely divided metal on one plate & a per oxide on the other by rapid mechanical means the placing of these plates in Soln & the reducing of the perox & the oxidation of the metal giving the Electricity - afterwards raising the lower oxide to a per by chemical means & the reduction of the monoxide to metal by gaseous reduction with heat & Lot of machinery for Easy.

handling + preparation of plate + hasped reduction + peroxidation so one man can handle apparatus for a 1000 lit station,

Experiment.

press freshly prepared peroxide lead on roughened lead plate with holes through it. use heavy pressure + face it with hair cloth - other plate press gently on roughened + holy plate. Lithurge reduce by gas + char press gently. also by lead plate in porous cup packed with lead reduced by Zinc.

also Make finely divided lead by Electrolysis in KOH sol from another lead plate = also by blowing air + also by stirring.

Also by holy plate with red oxide lead in holes for reducing the H,

In the theory both the above materials

should preferably be
insoluble,
give this placing on sheet
the material to give the E
a good long + exhaustive
trial before giving it up
Ascertain the theoretical
amount of lead to Mono
+ peroxide to mean in
weight per horse power per
hour
Try all other Salts
than Sul acid,
Try the same hard lead
Mercury as amalgam
and the red Mercury ox
amalgamated plate,

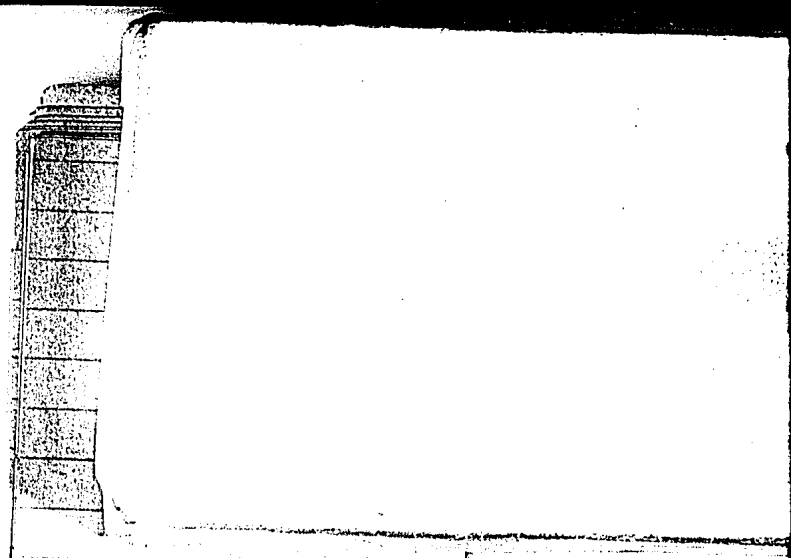
Try iron salts as the
cheapest,

---

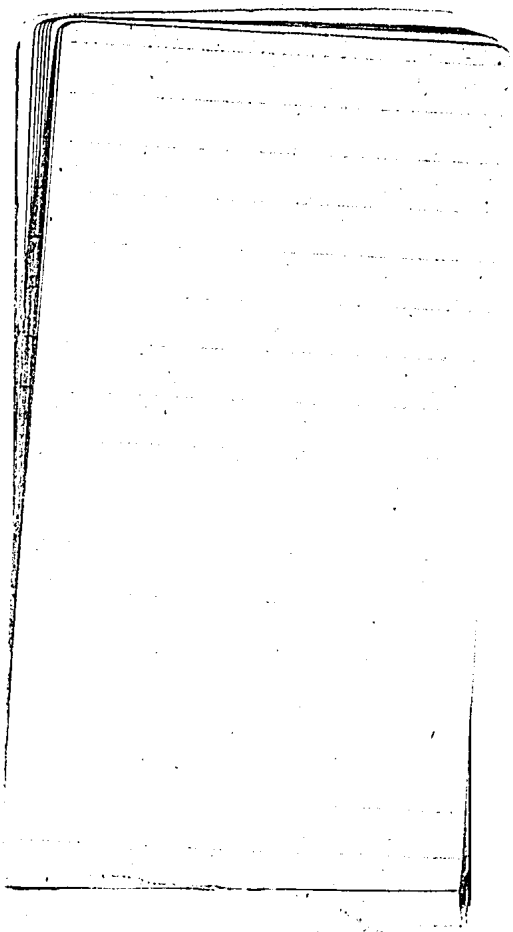
Carbon plate +
Lead plate with
finely divided
Lead — the Lead raised
to Mono afterwards
reduced by gas —
the H lost + dont get
full current first
by heat + gas agitation
prevented from Polar
perhaps the Carbon
may have peroxide on
it + air absorption

Extraction
plasmized surfactants
Carbon, ~~Cadmium~~
perhaps red Mercury
on Carbon

try common print
cloth dipped in
Solution of linseed
oil in which is mixed
iodide Cadmium crystals
fine, then dry by
Centrifuging at to give
a sticky surface



10 lbs, 3000 Lbs,
10000



Soak flax + manilla in water day or so blot & then freeze to bust it all into filaments.

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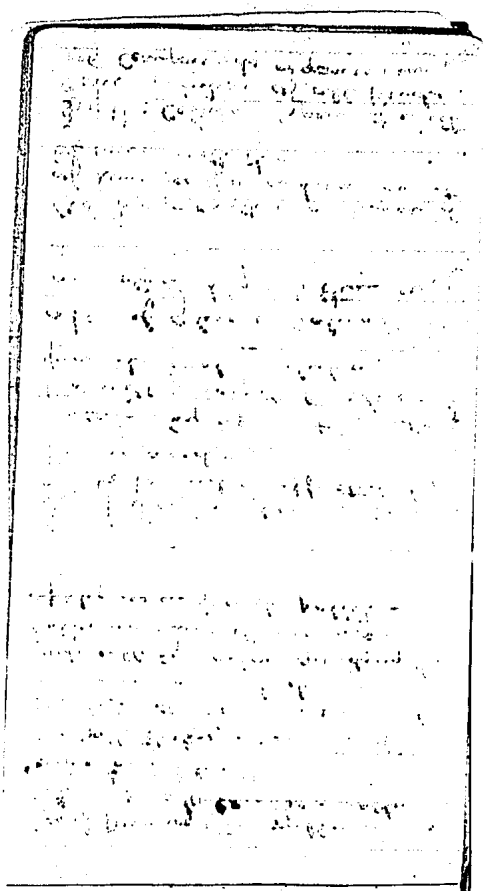
Look into Experimental research book to see what Essential oil it was that developed paper



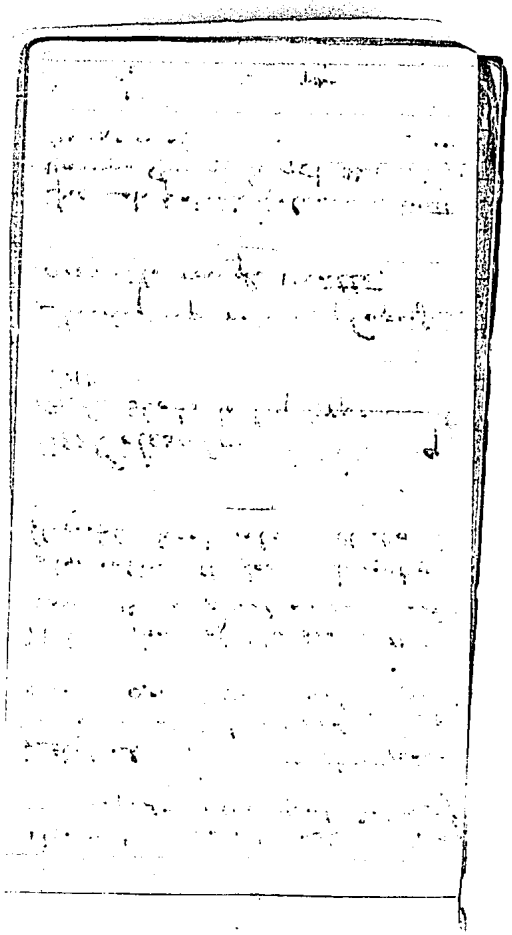
See if Silk can be dissolved & if it will Combine with glue, rubber, resins etc,

July 20 1885

Try dry Salts of Cupric ammonia & Cellulose with heat to dissolve for substitute for Celluloid.

July 20 1885

See if there is not a Volatile Compound of Calcium Magnesium etc whereby a deposit of Oxide can be put on Filament by Electrical Incandescence



See if pumice stone rubbed on
felument will make smoother
surface on felument
Mix With the fine size or stiff
to polish with 50 or more per cent
of Magnesia oxide which is not
reduced by Carbon grinding the
latter up fine with the size -
apply as in french polish -

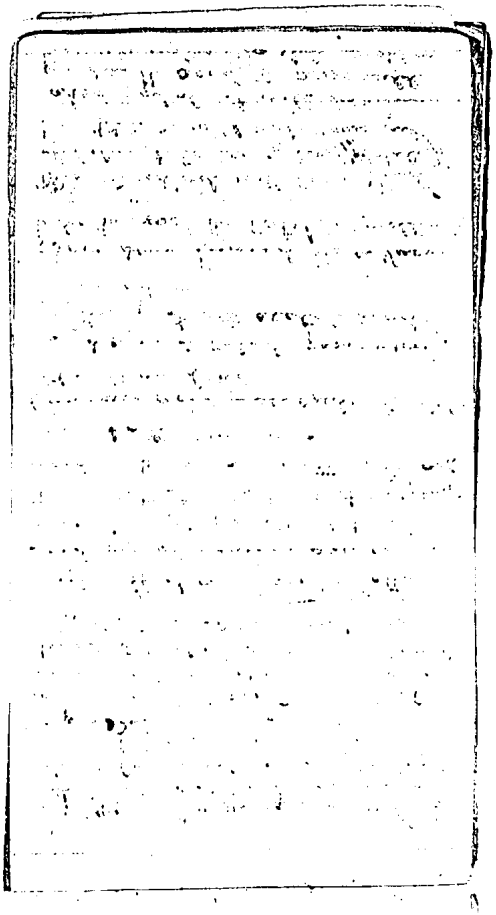
See if Bladder intestine etc horn
can be tanned or effected by
Tannic acid —

Ascertain by Experiment Everything
that will precipitate glue
from its water Solution.

also if glue is Soluable in
any other liquid than water.

As Gaga earth is a Compound
of Lime see if more lime cannot
be mixed with it -

Try the Celluloid Experiment with
Conc Solution of all Kinds
of Compounds of ammonia &c.



also put Nitrate Potash in it pour stir rapidly & then put Sulac'd

~~Rub~~ Rub glass with it & Expose to fumes of Nitric acid rub again & so on &c if can't get layer

Make, mixtures of Rubber with various things such as linseed oil, also rubber with Resins to get a flexible Sheet also Celluloid,

See Coles about furnishing Arch Stabs to try Experiment with,

Study up running Copperfoil ones to rough matte,

French polish foil sheets with various things to get shining surface of Carbon

Such as Dammar
= Cabinet paper be made of
it. by Cutting in exceedingly
Narrow strips, then felting.

Try experiment of using Linseed oil mixed with finely divided Electrotypers plumbago between Carbon plates agitating the Liquid so as not to allow actual Contact &
Keep adding plumbago as long as it comes down in resistance. Another way is perhaps better as to use finely divided metal as an acid will take that out of the Linseed easy —

Try the Effect on Linseed & Castor oil of Various oxidizing agents with & without heat, Nitric Nitrate Potash Hot Sulphuric acid — permanganate of Potash Vanadate Ammonia,
Chromic acid — Peroxide of metals other than Lead,
Fuse Lead and Potash, pass chlorine gas through it with acetate Lead in Linseed —

Boil some Linseed in a Vacuum tube to Expel the Volatile Constituent,

Mix Linseed oil with Every Kind of Solvent to see if Some Volatile Constituent will not come out.
also agitate it with Various powders to see if the pores will not take up the Volatile Constituent

preferable way would be to bleach Epidermis off the wheat or grain

Utilization of Bran combined with Cementing Material + Hydraulic pressure to make Base Material for all uses,

Act on bran with $SO_4$ - $ClZn$ + also HFl - also other Conc liquids, find its Solvent, also analysis to see if Epidermis is abnormally Constituted,
Mix with thin glue water then put in Centrifugal + throw most of it off then press + dry - Try Rubber also Gum-arabic also, Resins

gathering Butter,
Little Falls Man

Artificial Tortoise,

Utilization of Bran
as base material.
Cheap 1/2 c lb.—

Grind the oxide Lime or
Magnesia with the gelatin,
in paint mill for fulfilment,

Making Sheets bone by
Rubbing layer gelatin
then flow Bichromate K
~~dry~~ stay 2 mins—
Sun it & dry—then over it
again gelatin &c &c—

Mix. glue + Nitro-cellulose (cyanella
also glue + Cellulose dissolved
in Cuprie Ammonium.

See if there cant substitute
Compounds of Cellulose that
is solimble in 100 Gallon
Solutions,

---

Way Duplex,

Gold Separating Mac
by Copper chloride principle

Mix glue + organic Carbon
Compounds larger proportion
of Later - Carbon -



G. Stevens
Mench Wis -

Change Color Brand to
pure substitute for grinding
into flour -

1/2 cent allowable.
in addition to 1/2 ct
there earned 6c 2c profit

Bran worth 1/2 cent pound.
grain goes into Bran, but
can be separated,

get large sound
potatoes slice them
thin dry under gentle
pressure to make Carbons
from —
also Turnips, pumpkin
Squash. Egg plant, (by
Epidermis of Egg plant)
apple. Turnip, Beet,

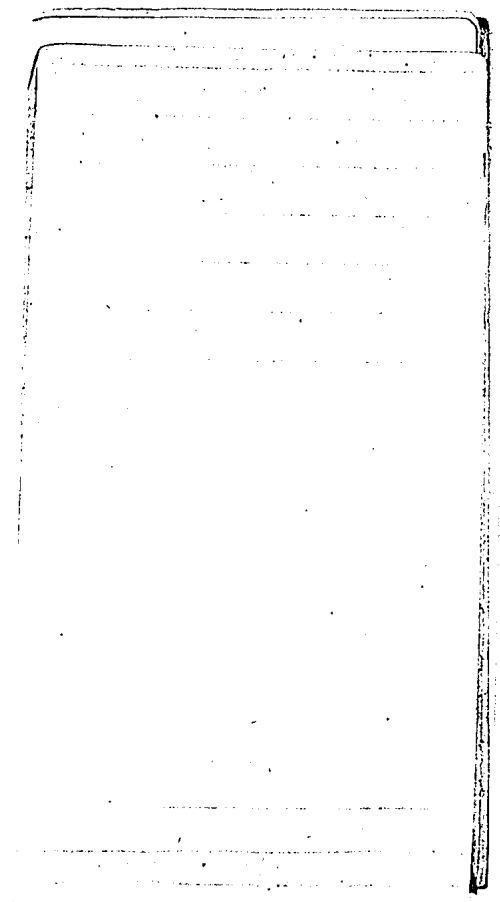
Carbonize - Collodion film
in Lubricd —

Mix Shellac or Lac
with Sol of Collodion
also other things filmize
& Carbonize

Licorice seems to Carbonize
with out any swelling
large amount gas goes
off - might be used
as binder or mixed
with other things. rolled
into sheets to cut
filaments from

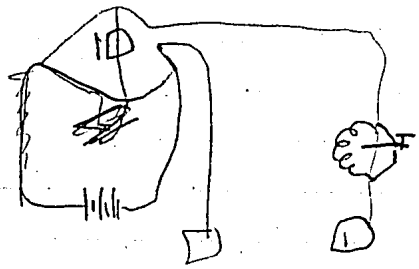
MCH 21 1889

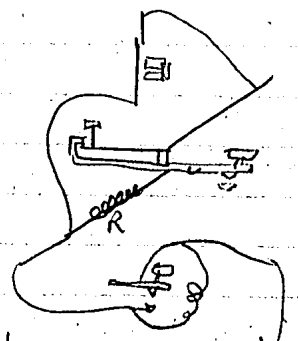

paint filament with
Camel hair brush
with acetate of Mag
also Lime, Mag
1st = then get Vac
& gently bring up
then b/k Vac & paint
again etc several
times - then get tape
& Phenomenon



See if a agate or other stone grinding Mill can be obtained perhaps a Bogardus paint grinding Mill will do to grind the Oxides with the Carbon Components —

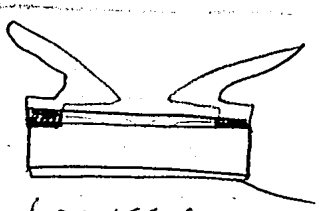
Σ



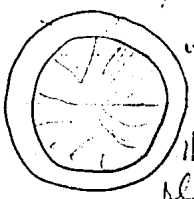



Artificial Mica

Ground Softly plug material
layer like French pat of the
oil then layer - Etc



March 21 1862



insulating ring on chalk
dia over it
thousandth of in
flat $\frac{1}{1000}$ cu in
resting on chalk
dia our light,
The $H_2O$ Rushing up + down
pores produce Vac +
work Dia, E

March 21 / 884

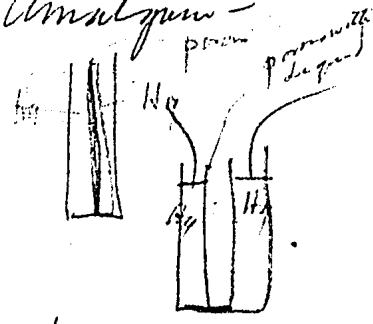
Forced Carbon Battery =

Use hot conc sol of Caustic Potash to absorb the CO monoxide to formic acid — finely divide the C in porous Cup - trace Some alkali Liquid out side Keep temp high

Bran has a Silica Surface = Hot soda Take it off = then by soaking + boiling Bleach - possible by displacement Can wash - try Eliobody for bleaching Bst rollers —

Float linseed oil in Nitric acid Mixed + warmed with Sulphuric strong to Keep it Concentrated

Secondary battery with Mercury Electrode & Such Solutions as to make a Hydrogen Amalgam —




Think this will do the trick. March 21/84

Conc sol Chl Magnesia rolled with glue, Carbohyd —

Melt glue or gelatine ~~mixed~~ mixed with the Oxide Magnesia or Compound thereof in the smallest quantity of water possible & force this out into sheets through a die, blower or otherwise. Cooling to set but quick when it comes out.

by this means a veneering
glue Water can
be used -

---

Try dissolving glue in
Dilute phosphoric
anhydride,

Test these a Succinate
of Lime or Magnesia,

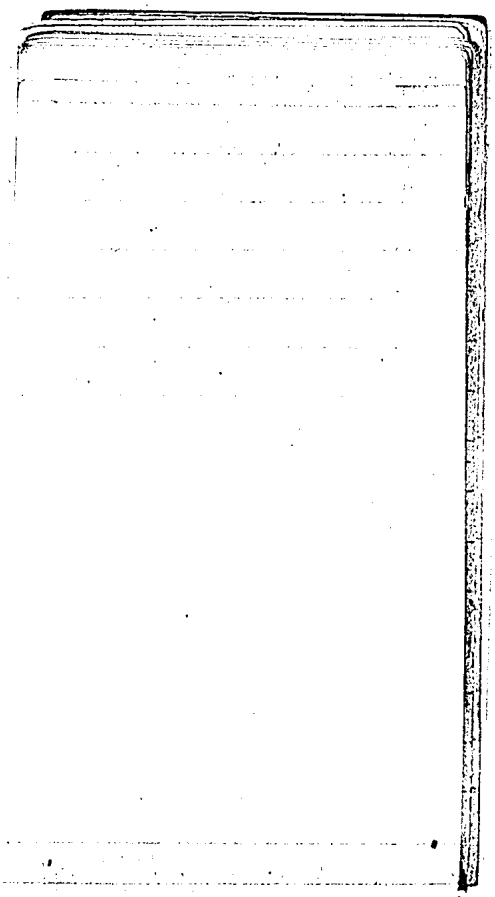
Talonate Magnesia
will perhaps
Carbonize & mixed
with Gluten glue

I wonder if starch
is ground so as to
break all the starch
granules if it is
moistened + dried
in sheets for wildt
work —

Try this grinding
with glue —

perhaps Gutta
percha moped with
lime Magnesia &c
works —

Try Gum Zanzibar
+ Magnesia Rolled
in linseed oil +
made in sheets a la French
polish



Lwonder if iodide
of nitrogen precip
mixed with glue.
Wouldnt Carbonize -

---

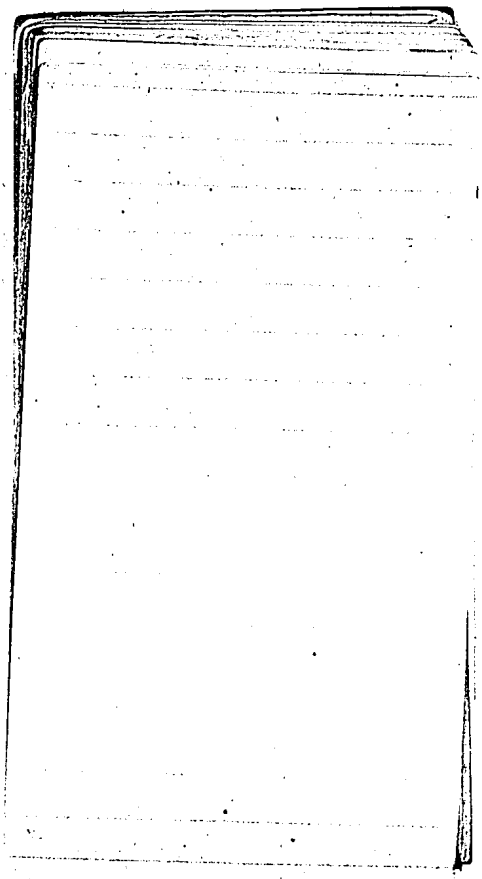
Try asphalt + Magnesia
also Compounds of
Lime + Magnesia Soluble
in Menstrum ~~—~~ in
which asphalt is
Soluable in -

also Tragacanth as
a base.

Try Vanadium as an
Oxidizer for Linseed
and Castors oil

Iodide of the high Melting Oxide might be used in place of Chlorides as the Iodide blowup much Easier,

Use Cerium & the rarer oxides in the Experiment, also Phosphate other than Lime,

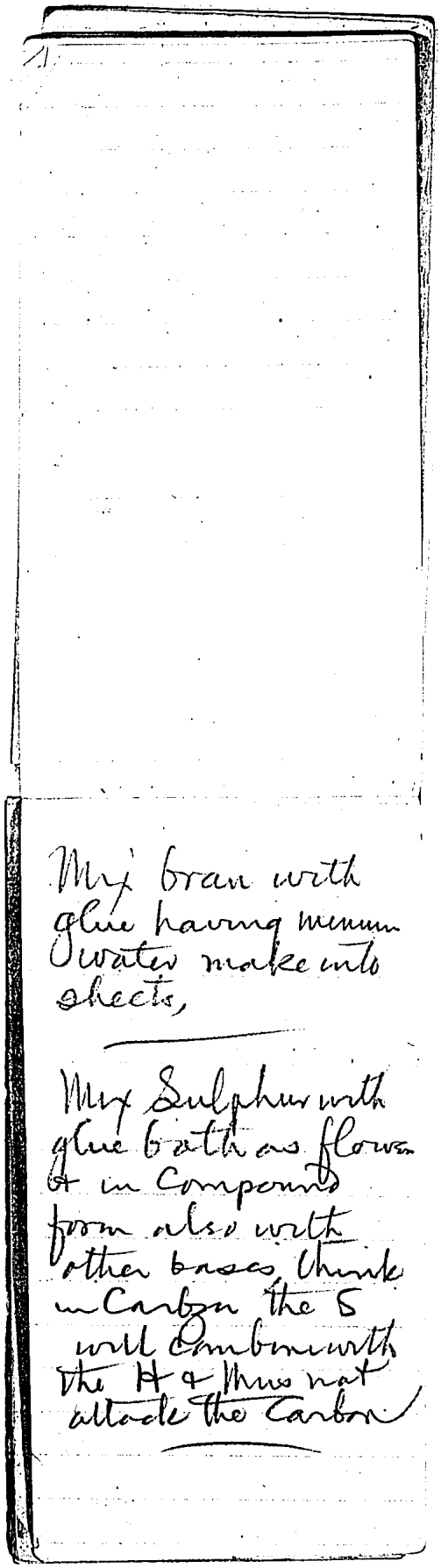


Perhaps in the Silk
Experiment an Elastic
precipitate from
Something might be
formed on a platinum
point immersed in
the liquid & wound
up on a platinum
Cylinder with the
Liquid,

Can a bladder be
Tanned, if so it
would work owing
to Oxygenation.

Make a 100 Sticks 1/2 dia of charcoal at Lamp factory have them turned from White wood & other woods for Experiment in direct Conversion —
Make them 8 inches long —

Manganate Soda for Coloring Cane & Air reeds —

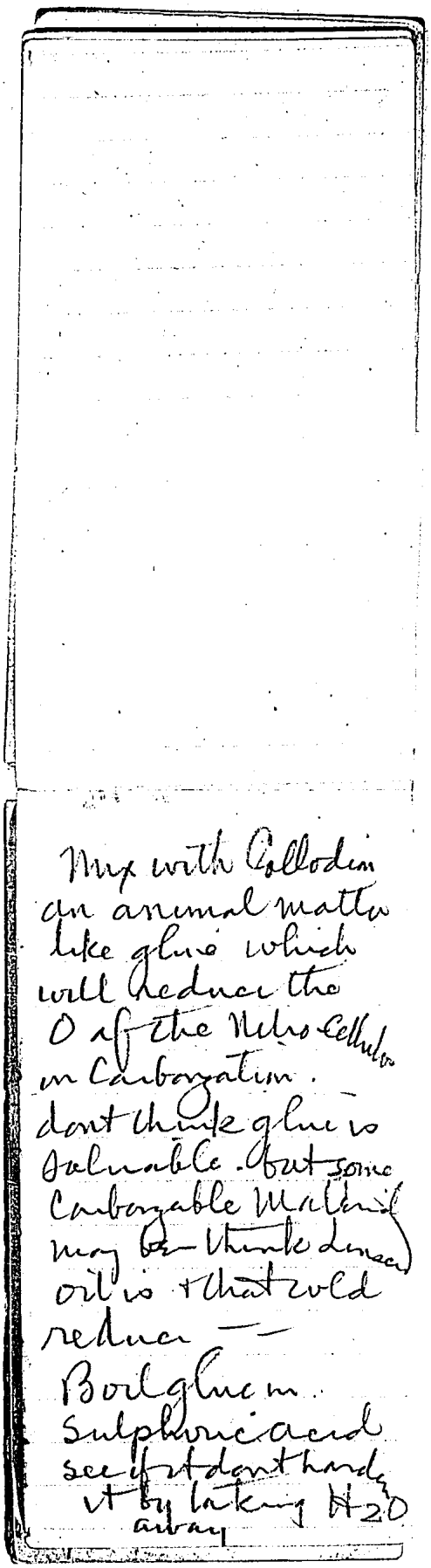


Mix bran with glue having mmmm Water make into sheets,

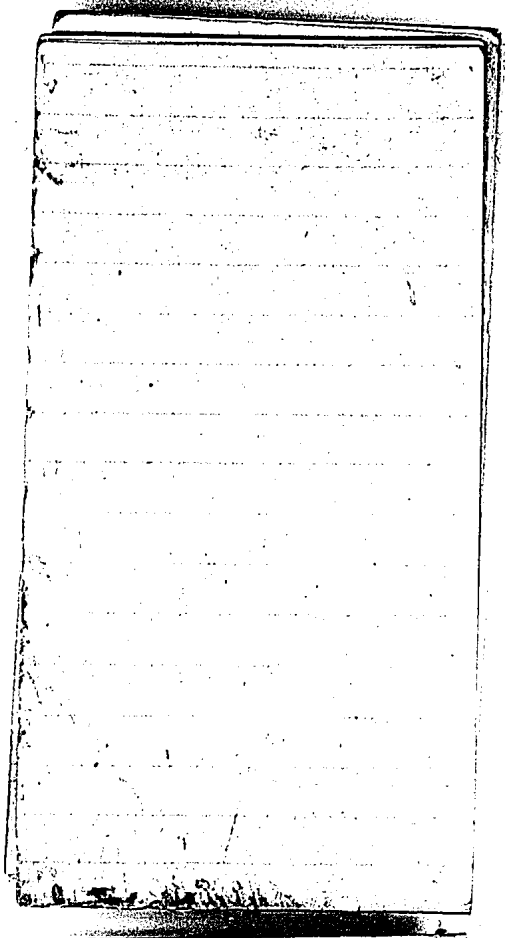
---

Mix Sulphur with glue bath as flowers of in Compound from also with other bases, Chunk in Carbon the S will Combine with the H & thus not attack the Carbon

---

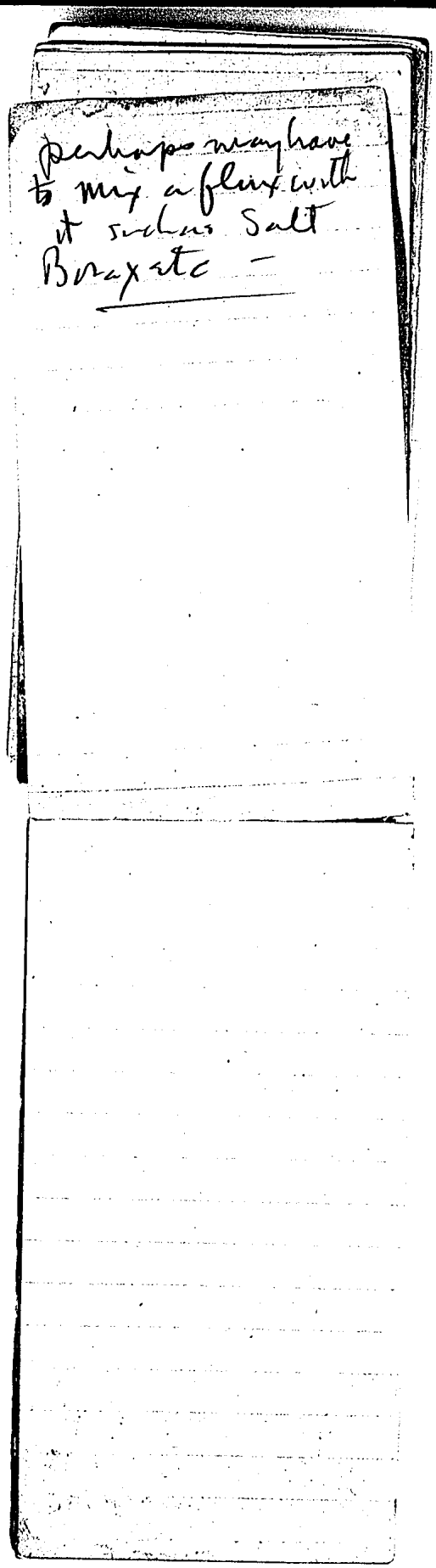


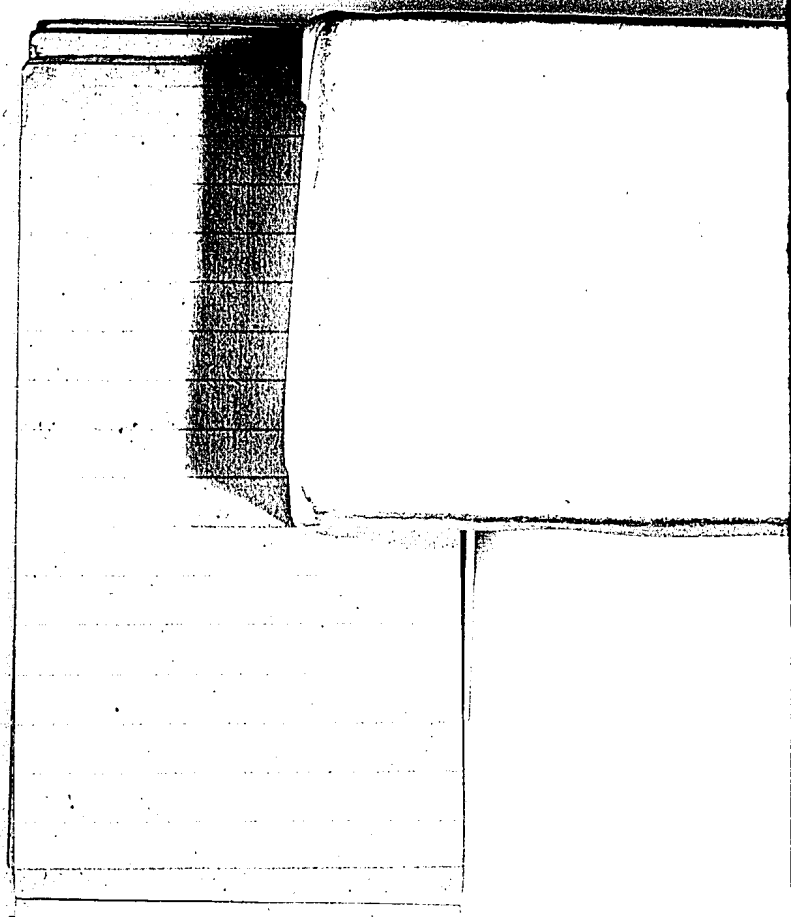
Mix with Collodion
an animal matter
like glue which
will reduce the
O of the Nitro Cellulose
in Carbonation.
dont think glue is
Valuable. But some
Carbonable Material
may be—think Linseed
oil is + that would
reduce —
Boil glue in
Sulphuric acid
see if it dont harden
it by taking H2O
away



Cant-something Gr
put in Collodion
that will be decomps
by light such as the
blue Solutions hence
after sheet is made
Exposure to light
decomps the Nitro-C
to plain Cellulose

Mix coal tar also
Charcoal also oxide
Petroleum with Litharge
& also Red lead in
Crucible with Cover &
Sand & Borax to Globule agst
problem + Coal over


Perhaps may have
to mix a flux with
it such as Salt
Borax etc —



Mix Magnesia oxide - also Carb. with fine Telephone lamp black and gelatine as much as it will stand of the magnesia - also try Tar Magnesia + lamp black - also try Lime, Oxide Aluminum + other oxides,

Mix. gelatine or rather glue with water + the oxides, also with chlorides of the infusible earths,

Try tragacanth and the oxides, the idea being to use as much of the oxide as is possible with the Carbonizable organic material,

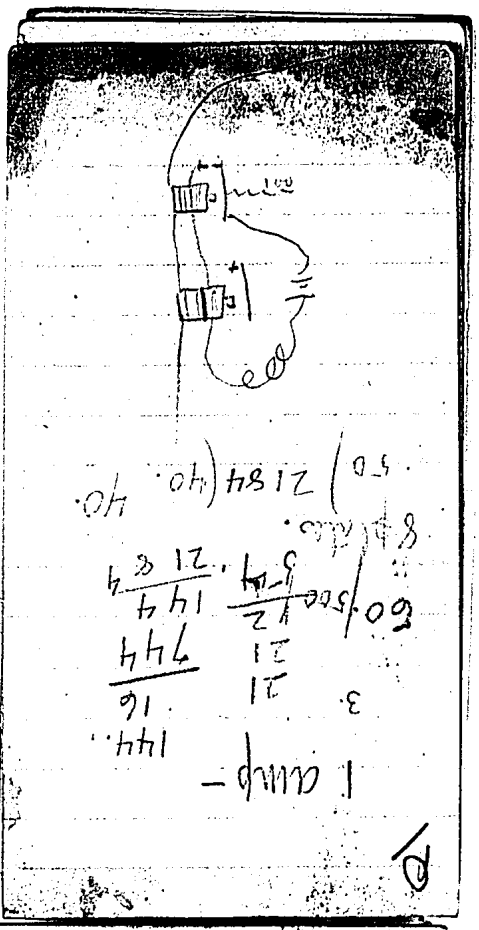
If it is possible mix Tar with the oxides only

I have a theory that the oxide will not be reduced and that the organic material will be carbonized as a lace work the oxide staying there hence when Carrying Commercial 1/2 or more will be white oxide, hence the carbon will last twice as long and the globe will be no blacker besides it will have a high resistive Coefficient,

also try boiled linseed + the oxides rolled out thin - sheets - a la putty -

Sheet gelatine treated with Bichromate of Ammonia

Magnesium aluminum

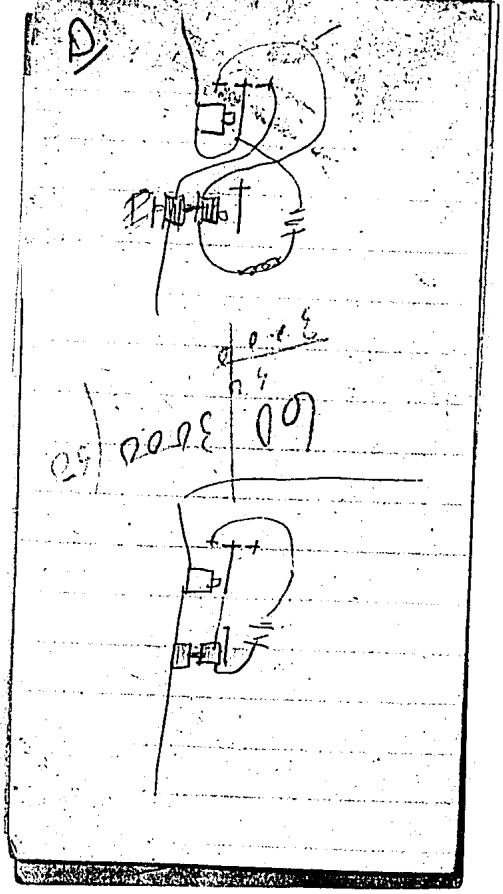


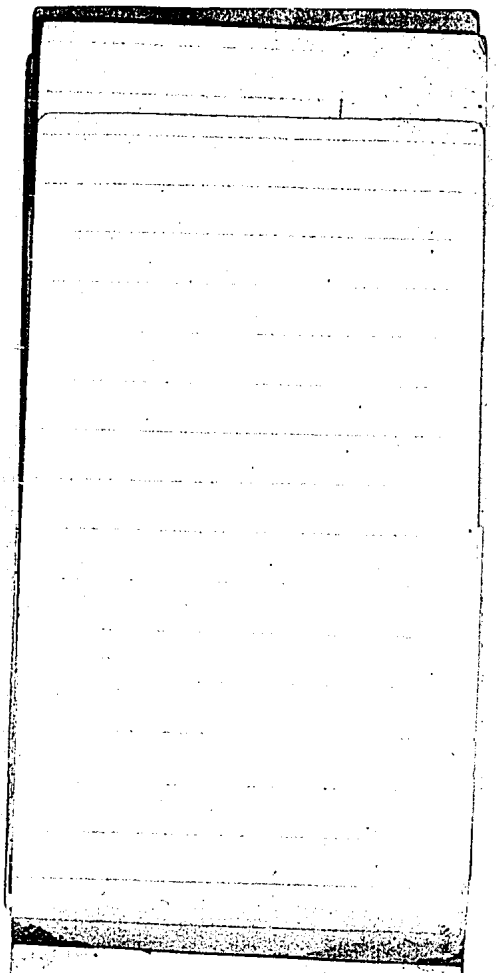
am told that an
west side Colorado
River. Near mouth
part of a Delta. near
Fort Yuma, where it
pours into Gulf.
Man named Tom
Denton Letter reach
him Care ——
a Rush probably
Uranus Merville says
Marvellous fuchsia in
his office owns it would like to get
up & to work its fibre!
Rush grows 10@15 ft
high — get some

1/10 th obj = 1/1600

16 mm | 34.60 21.7
3 2.30
2.00
5.00
750 Lit.

75 — 1800
Pump .150
Engine — 1400
Fuel Line — 250
Belt — 30
Belt, Fan 180
Dynamo 3.000.
Sulfuring Valve — 300
Ignition 75
Extra work 450 3630
Piping 300 3450
Calculation 30





450.-
375-
20,-
150.
100.
50-
25-
50

30

1220.

30.
50
10
20
110.

96 Fare
36 – Pullman
16 Eating
246 Magnolia
4 Fare Mag
4 Augustine
6 Palatka
67 Palatka Hat
67 Sanford
150 Tampa
13 Shells
16 Waiters
16 going boat
20 Coming boat
20 Ice.
40 Maine

~~20~~ Baths
8 Extra

684

7

688
600
40
1328

1500
1328
172
12
160
25
135

400 cells.

25 sqr inches. 3 inches apart
3 ohms. $\frac{1}{4}$ inch apart. .25 ohm
hence 4 sqr feet. 2304 sqr inches
$\frac{1}{400}$ of ohm.

20 — 100
80 — 200
320 — 300
1250 — 400
1720. — 500

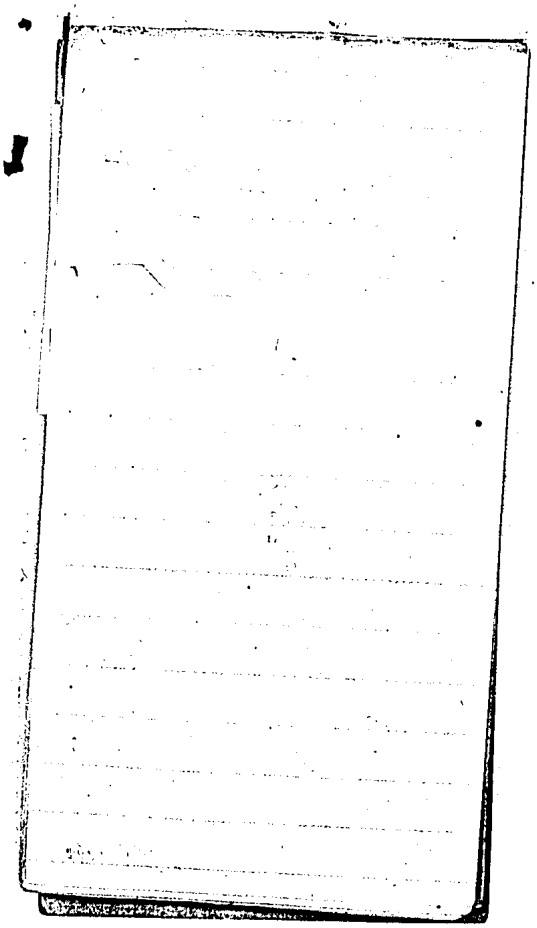
48
48
384
192
2304

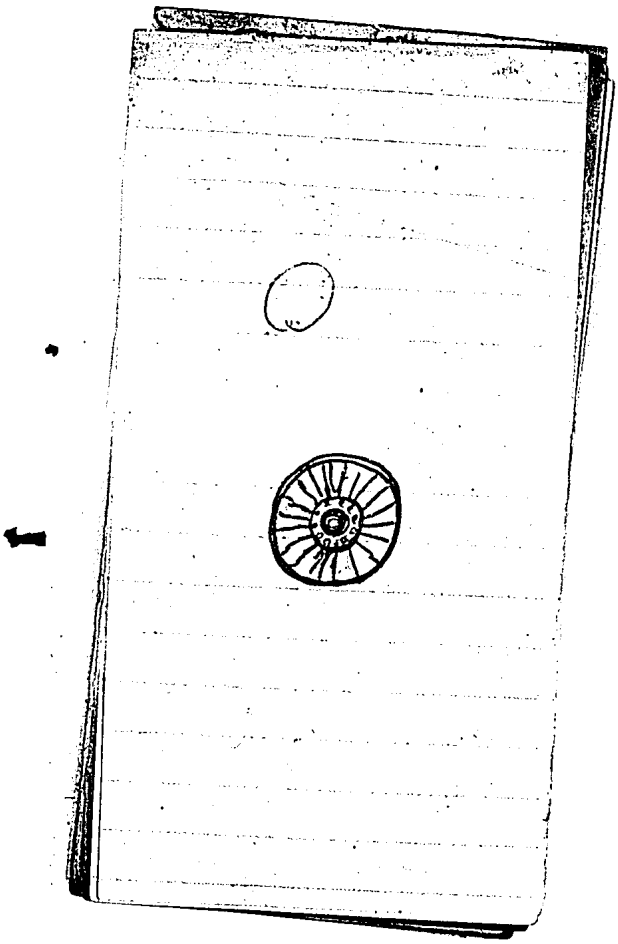
92 . 25 1
46 0125 2
006 4
03 8

25 | 2304 | 92
225
5-4
5-0

.25
10 ohm weld
$\frac{1}{100}$
$\frac{1}{400}$ ohm

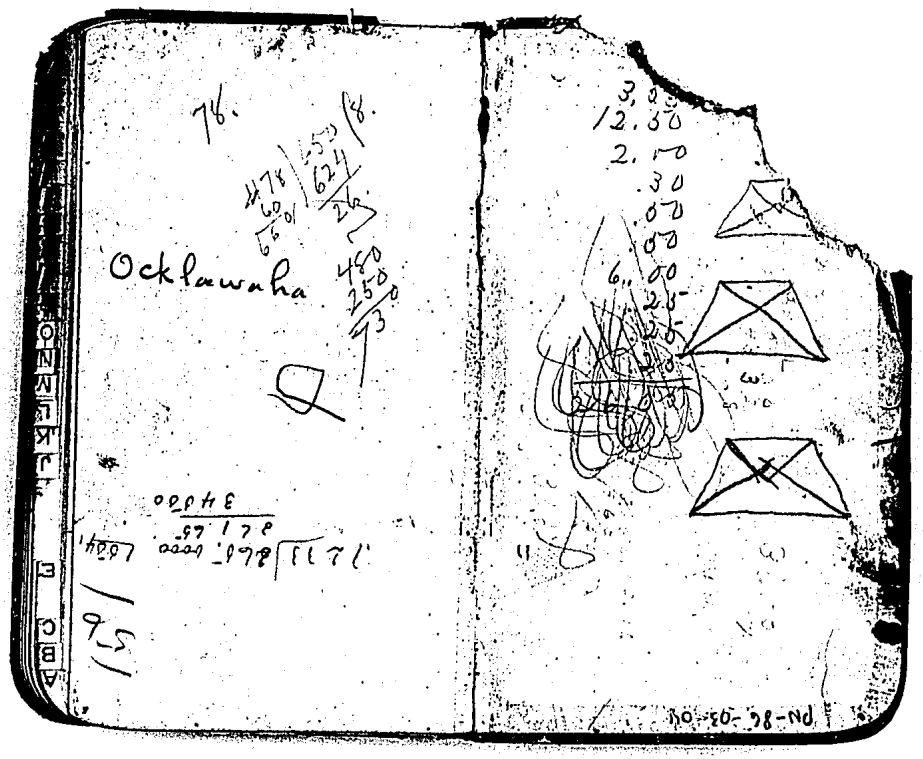
100 hp current. with 20 tons require. 81. lons to double the deposit.





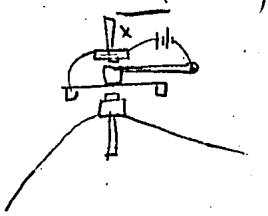
## Pocket Notebook, PN-86-03-04

This notebook covers the periods March and October 1886. Most of the entries are by Edison. Included are notes and drawings relating to the phonoplex, a hearing aid, lamp filaments, and kerosene lamps. There are also notes by Edison to his patent attorney, Richard N. Dyer, regarding an interference with Frank Sprague. In addition, there are entries in Mina Edison's hand pertaining to household accounts and suppliers. The front cover is stamped "Address." The book is unpaginated, and it has been used in both directions. Approximately 60 pages have been used. Numerous pages have been torn out of the book.


ABC EJUNO
Ocklawaha
PN-86-03-04

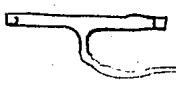
March 2 1886

Pass strong currents through solutions & then test with their proper reagents, also subject to field of powerful magnet see what changes if any



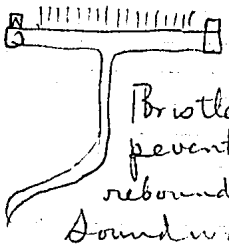

Phenopkyi X Lifts weight nearly upon eq throws it open also when whole power of weight makes down screw

Deaf March 4 1886



Jag

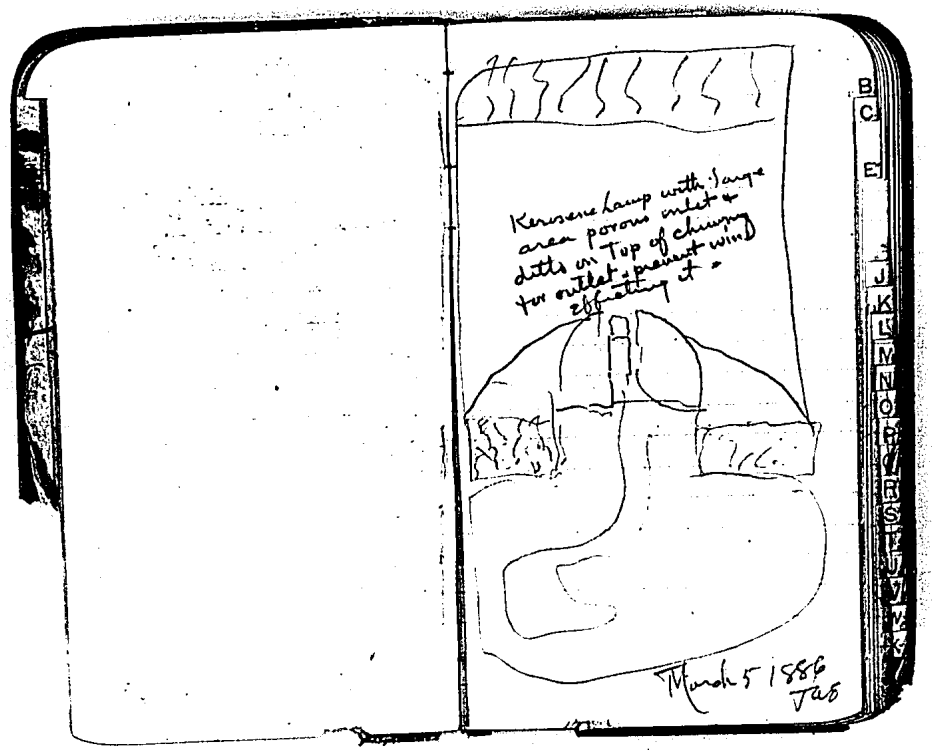
Vacuum – also air – Hydrogen
$CO_2$ under varying pressure
also. Ether –

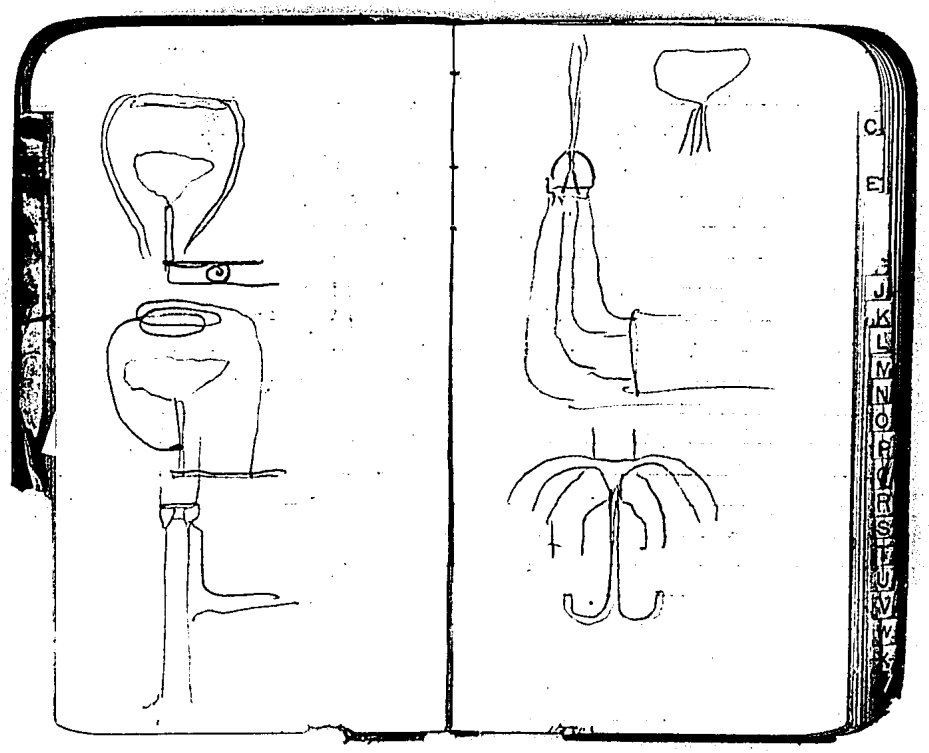


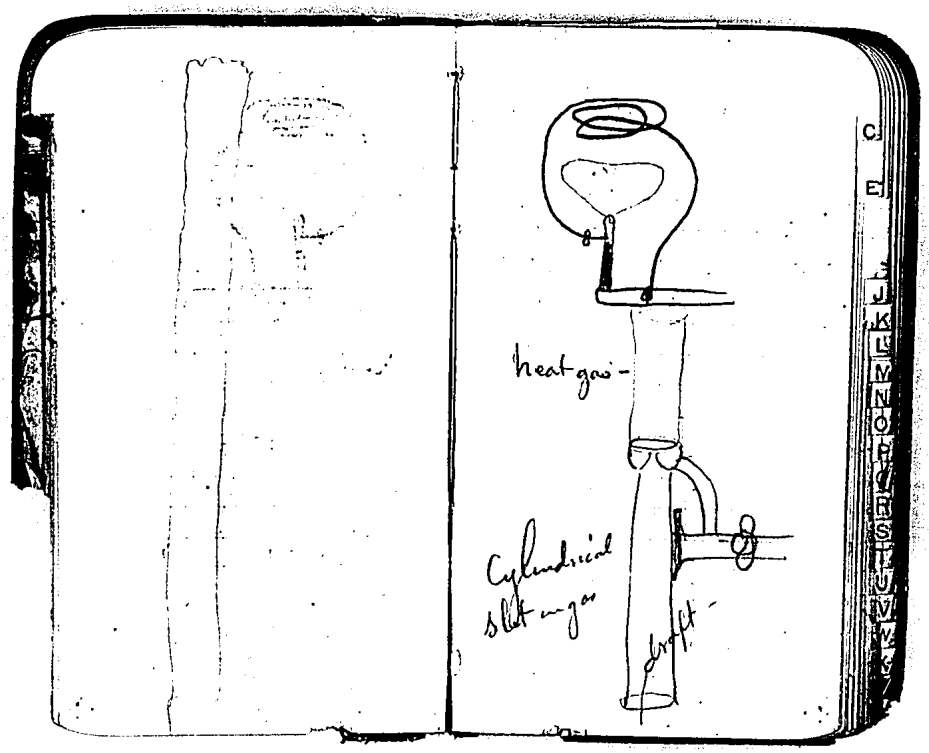
Bristles etc
prevent
rebounding
Sound waves
felted –
Velvet,

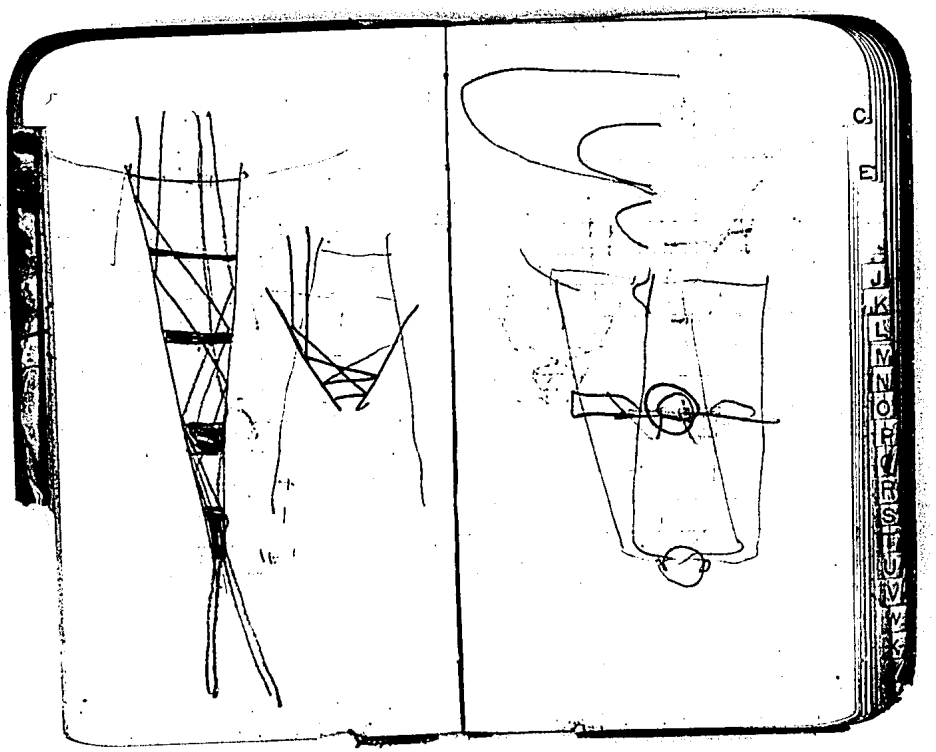
A B C E J K L M N O P Q R S T U V W X Y

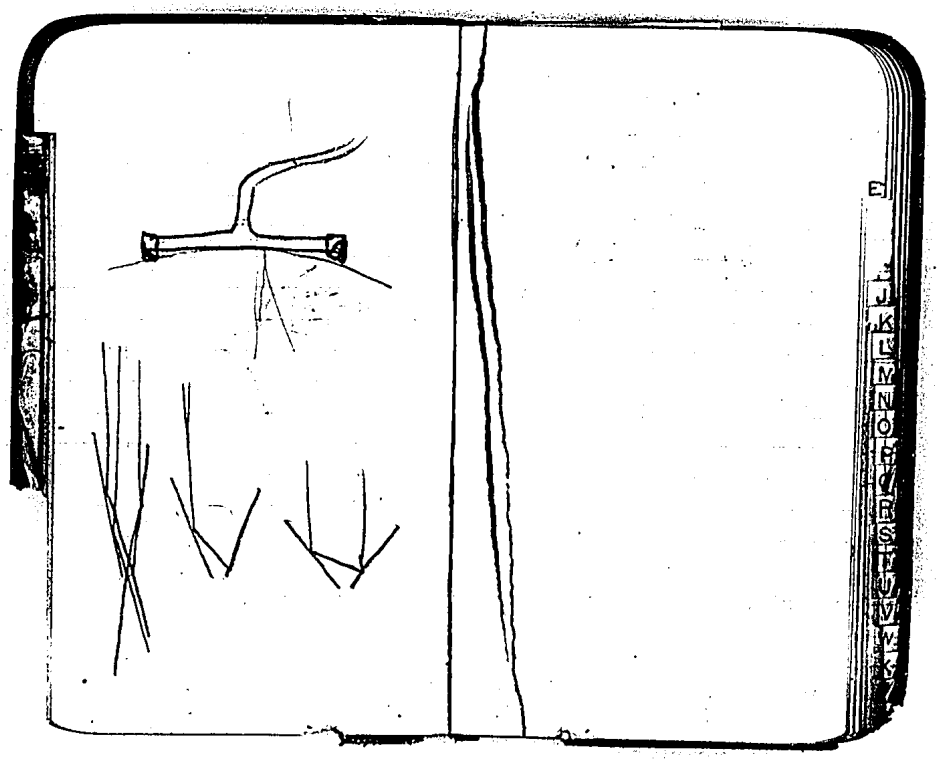
Good
To dissolve out the resin
of Bamboo Ele. was
Soaking Linseed oil
(Fe) for 24 hours. This
is Bamboo resin process
nothing else will do it
Def
Try Microphone
again
B
C
E
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X

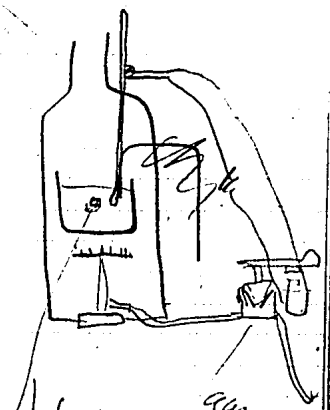

Kerosene lamp with large area porous inlet + ditto on top of chimney for outlet + prevent wind effecting it -
March 5 1886
JAS


C
E
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y

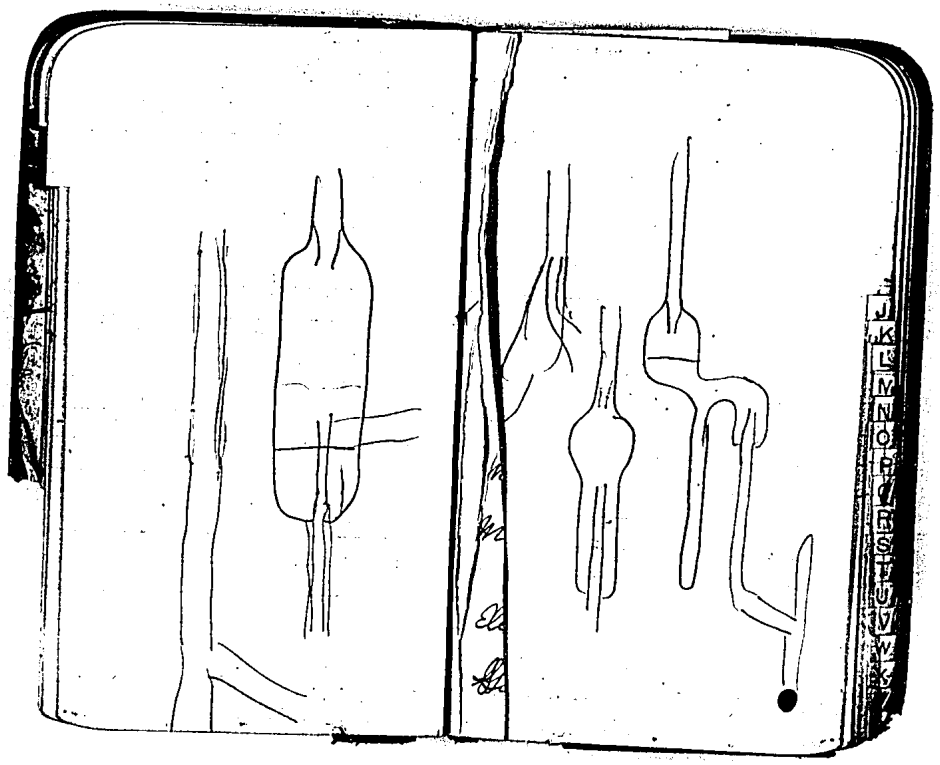

heat gas
Cylindrical slit burner
draft

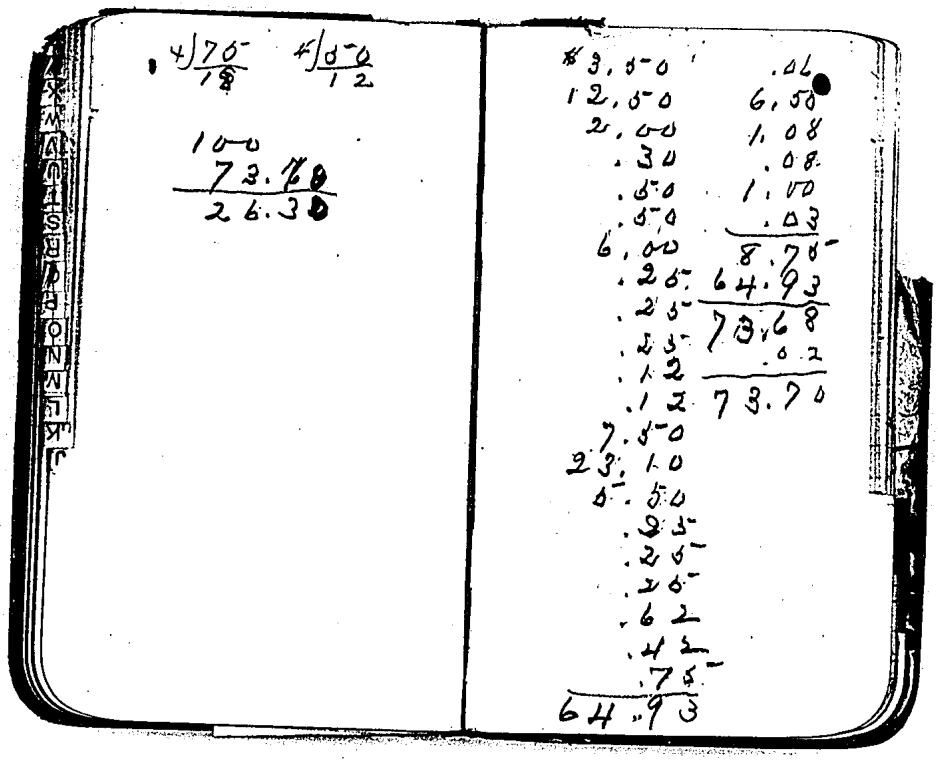

C
E
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y

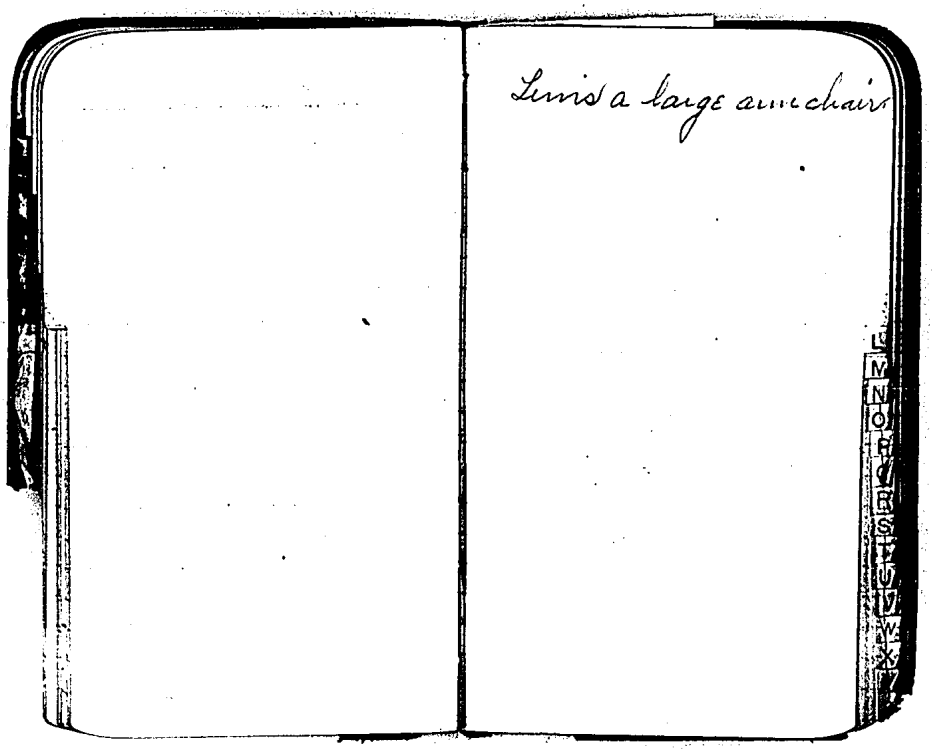

E
J
K
L
M
N
O
P
Q
R
S
T
U
V
W

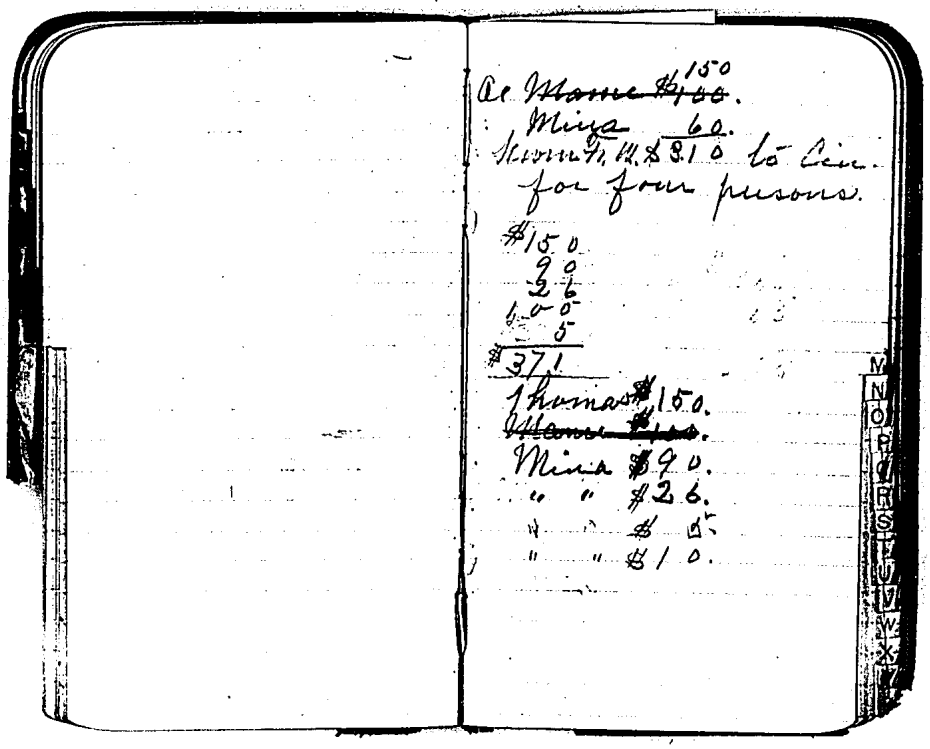



Container heat source
temperature


J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z


EXPENSES OF OWNERSHIP
4) 70-
18
4) 8-0
12
100
73.18
26.30
$3.50
12.50
2.00
.30
.50
.50
6.00
.25
.25
.25
.12
.12
7.50
23.10
5.50
.25
.25
.25
.62
.42
.75
64.93
.04
6.50
1.08
.08
1.10
.03
8.78
64.93
73.68
.02
73.70


Linis a large armchairs
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y

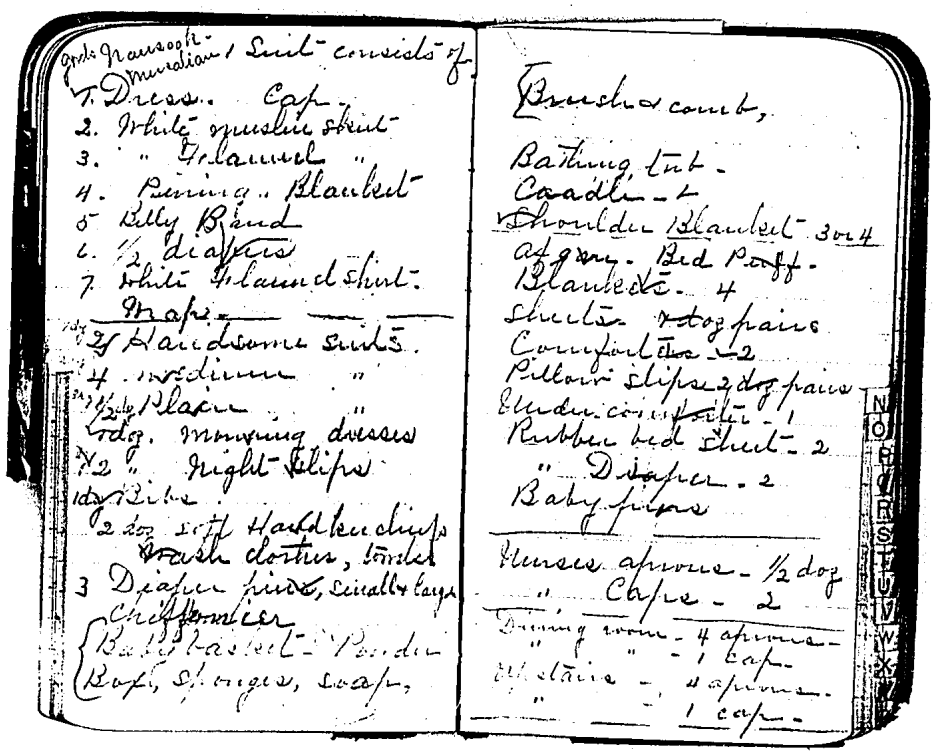


Re Maine $150.
Mina 60.
Norman 11. $310 to Cin.
for four persons.

$150
90
26
10
5
$371

Thomas $150.
~~Home $150.~~
Mina $90.
" " $26.
" " $5.
" " $10.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z



3rd Ramsooh Meridian / Suit consists of
1. Dress. Cap.
2. White muslin shirt
3. " Flannel "
4. Piping " Blanket
5. Belly Band
6. ½ diapers
7. White Flannel shirt.

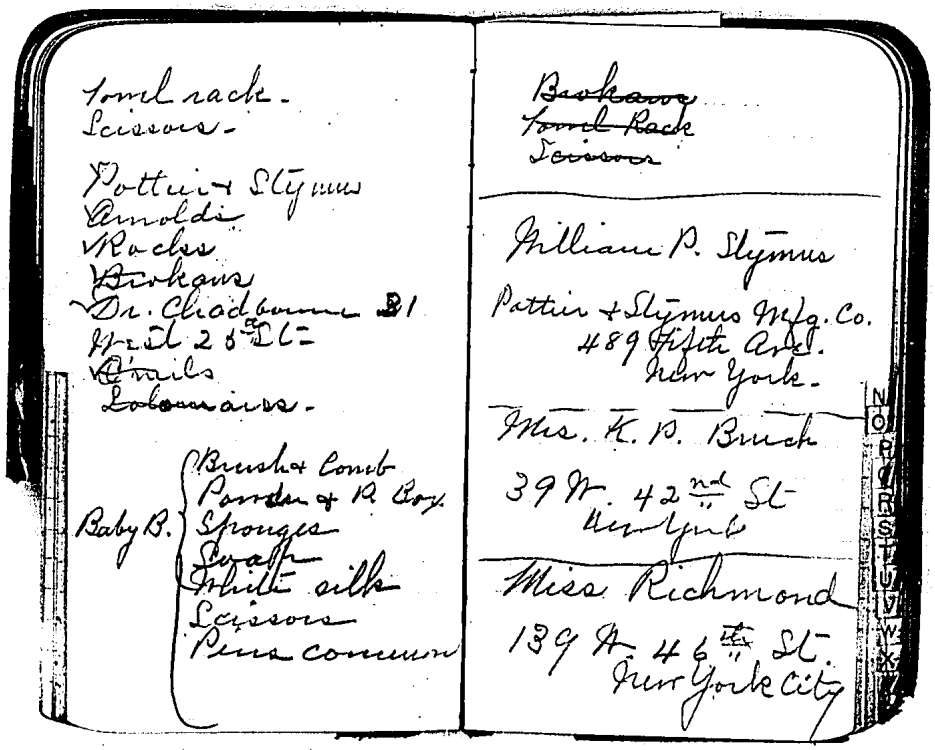
Mapie
3 Handsome suits.
4 medium "
1½ doz Plain "
6 doz. Morning dresses
12 " Night Slips
1 doz Bibs.
2 doz soft Handkerchiefs
Wash clothes, Towels
3 Diaper pins, small & large
Chiffonnier
Bath Basket - Powder
Brush, Sponges, Soap,

Brush & comb,
Bathing tub.
Cradle - 1
Shoulder Blanket 3 or 4
Rag rug. Bed Puff.
Blankets - 4
Sheets - 2 pairs
Comfortables - 2
Pillow slips 2 doz pairs
Blanket cover - 1
Rubber bed sheet - 2
" Diaper - 2
Baby pins

Nurses aprons - ½ doz
" Caps - 2

Dining room - 4 aprons -
" " - 1 cap -
Waiters - 4 aprons.
" - 1 cap -

N O P Q R S T U V W X Y Z



Towel rack.
Scissors.

Pattin + Slymus
Arnoldi
Racks
Birkgaus
Dr. Chadbourne 21
Wall 25th St.
Nails
Colognes.

Baby B.
- Brush + Comb
- Powder + R. Coy.
- Sponges
- Soap
- White silk
- Scissors
- Pens common

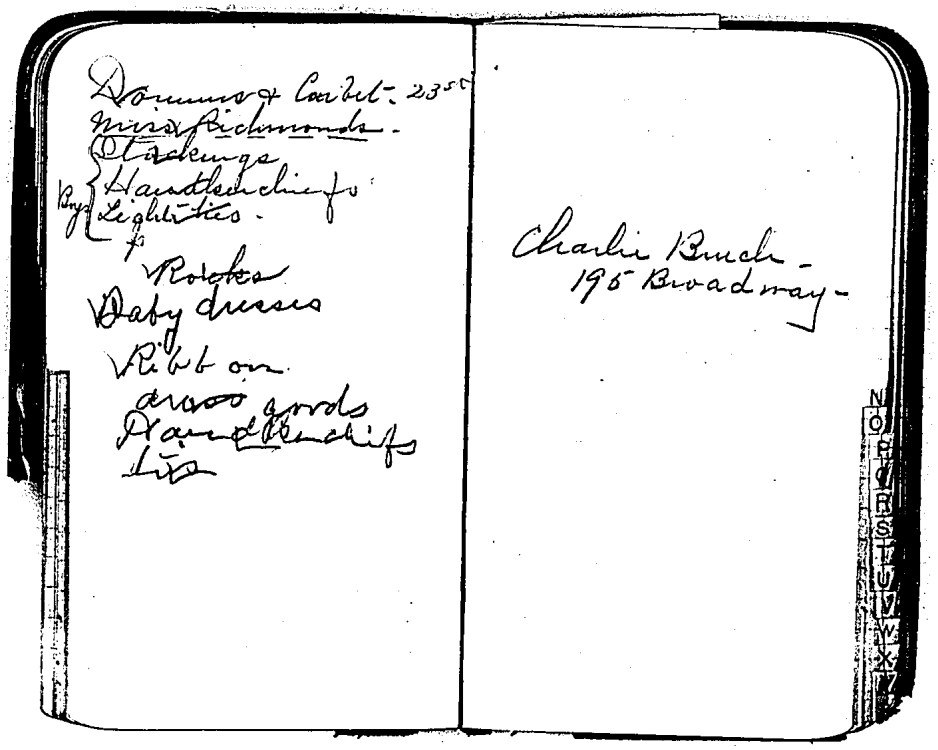
Backgaus
~~Towel Rack~~
Scissor

William P. Slymus
Pattin + Slymus Mfg. Co.
489 Fifth Ave.
New York.

Mrs. K. B. Burch
39 W. 42nd St
New York

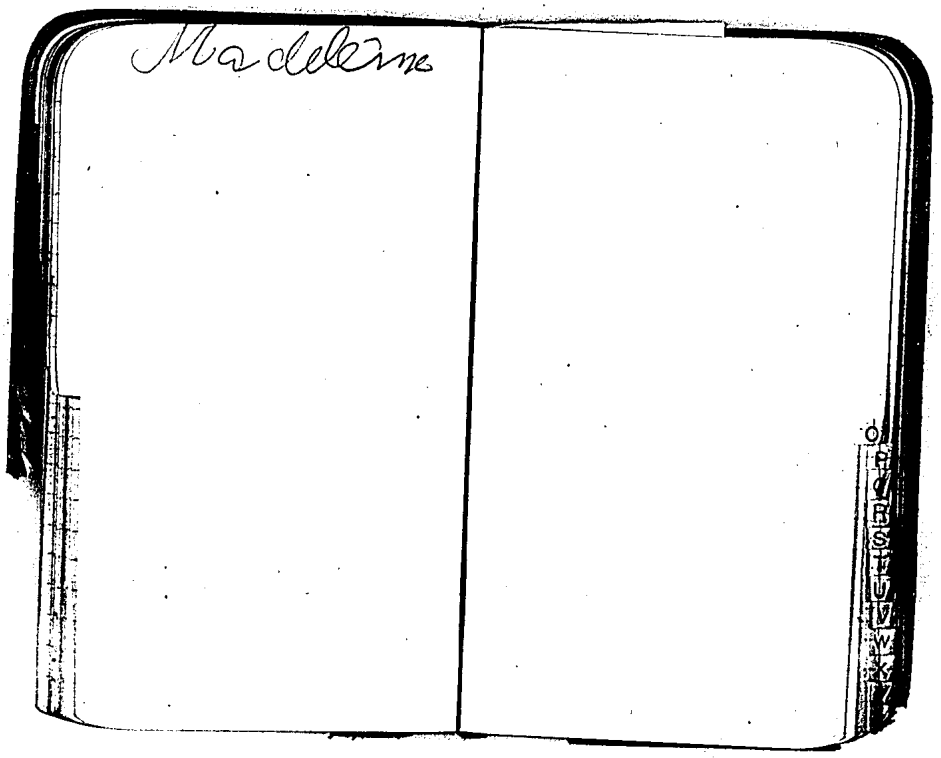
Miss Richmond
139 W. 46th St.
New York City

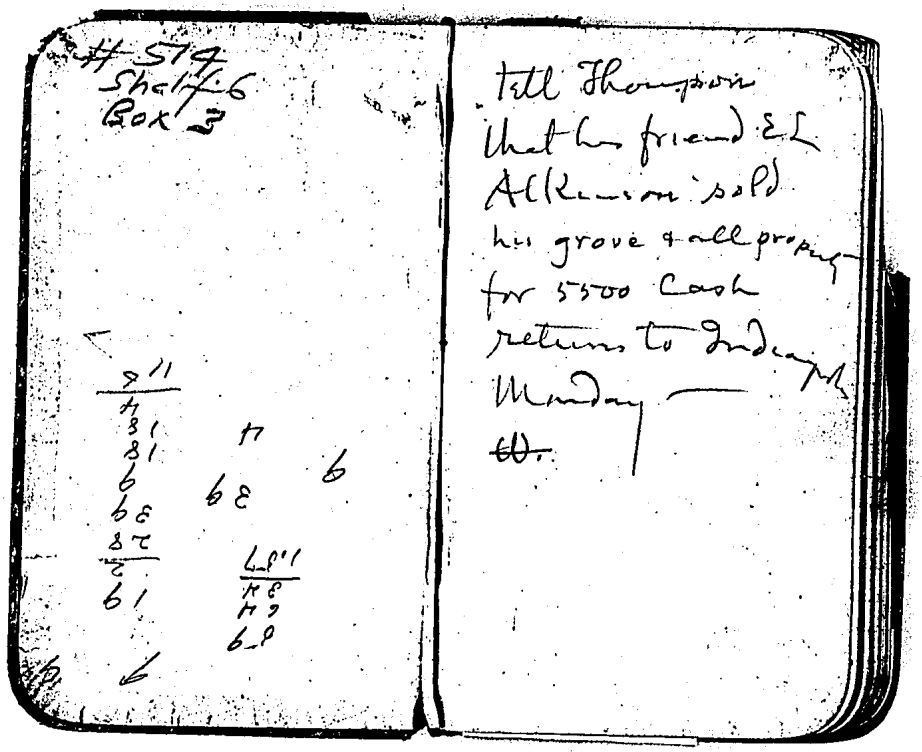
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

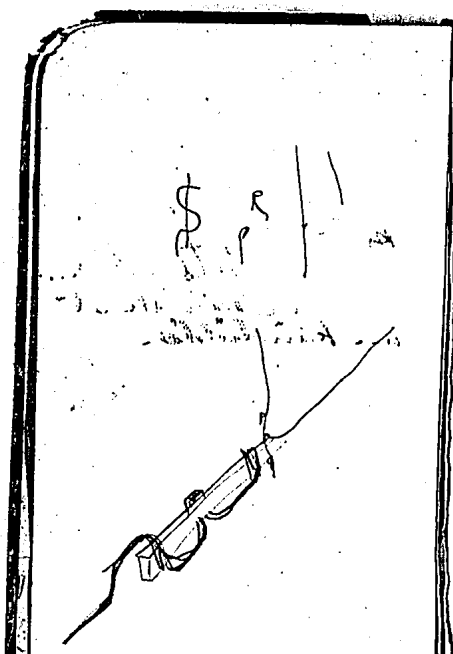

Dommerich & Corbet - 23rd
Miss Richmonds -
Stockings
Handkerchiefs
Buy { Neckties -
for
Robes
Baby dresses
Ribbon
dress goods
Handkerchiefs
Ties

Charlie Burch -
195 Broadway -

N O P Q R S T U V W X Y Z


Madeleine
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z


#574
Shelf 6
Box 3
Tell Thompson
that his friend E.L.
Atkinson sold
his grove & all prop
for $500 Cash
returns to Indian
Monday —
ED.

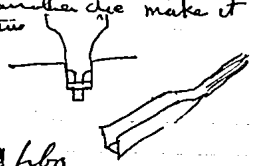


with the new clamp Gaboriault is making use platinum foil around carbon & screw into a spring socket of platinum

get some apple wood also box wood & fibres &

Oct 3 1886

clamp out end in platinum then mandrel die make it square then



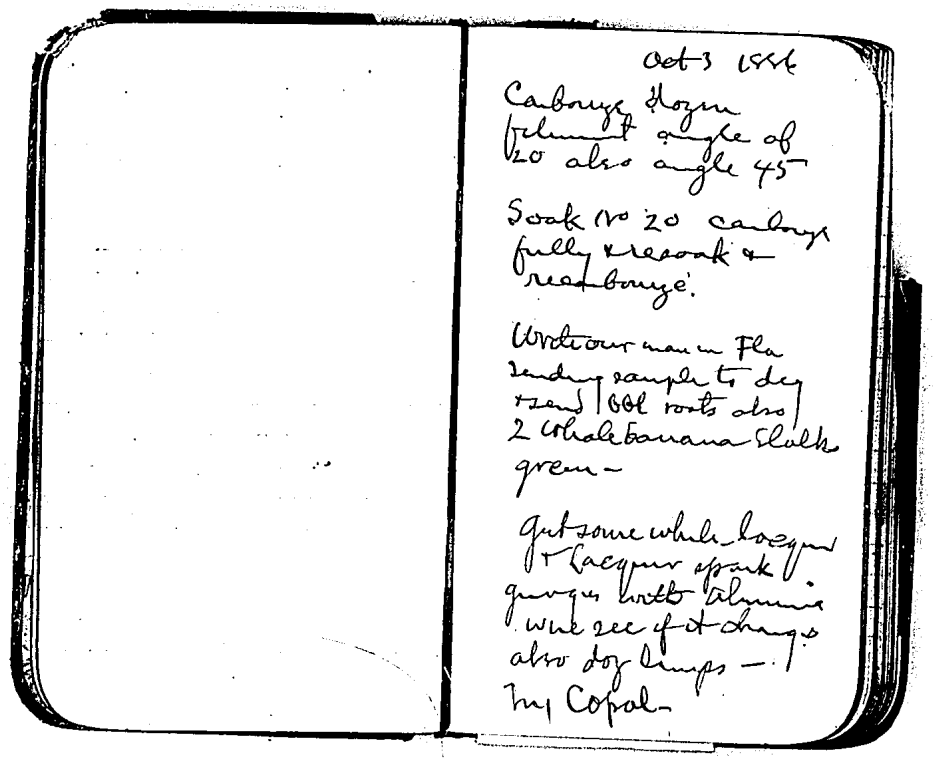
fibre

get some Electrolyzer plumbago put some platinum in — also put some in bottom Cup put fibre in & then with plunger puts it hard then add more plumbago & rake fibre pressure

Oct 3 1886

+so on —

Make Moulds of Drotrin + plumbago pencil — Use of Lamp & get the dies for new plumbago a veg carbon moulds — Draw Manilla through die after it has been soaked in following Sugar Caramel Liquorice Starch Tragacanth Linseed Mucilage, Gum arabec Rosin. dry the felt then with soft die, also through hot oil to soften binding material draw down dry hard dry + carbon Try all the other dies this day — Also bamboo



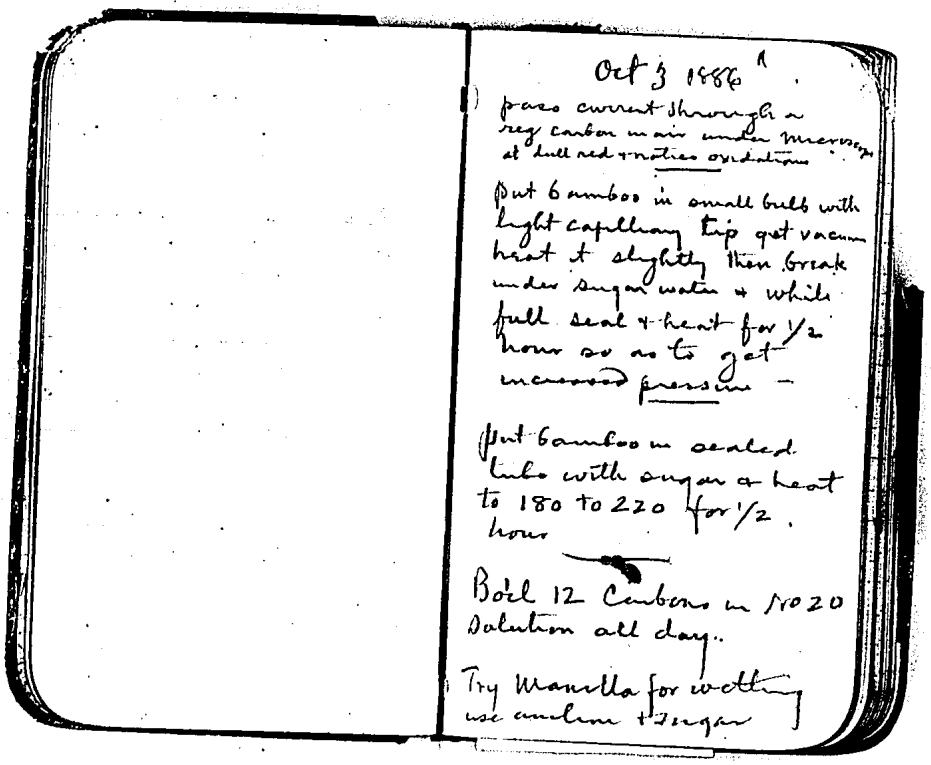
Oct 3 1944

Carbonyx Horn
Plummet angle of
20 also angle 45°

Soak No 20 carbonyx
fully + resoak +
test bonye.

Write our man in Fla
sending samples to dry
+ send 100 roots also
2 whole banana stalks
green -

Get some white lacquer
+ lacquer spark
gauges with Aluminum
wht see if it changes
also dog clamps - !
Buy Copal -



Oct 3 1886

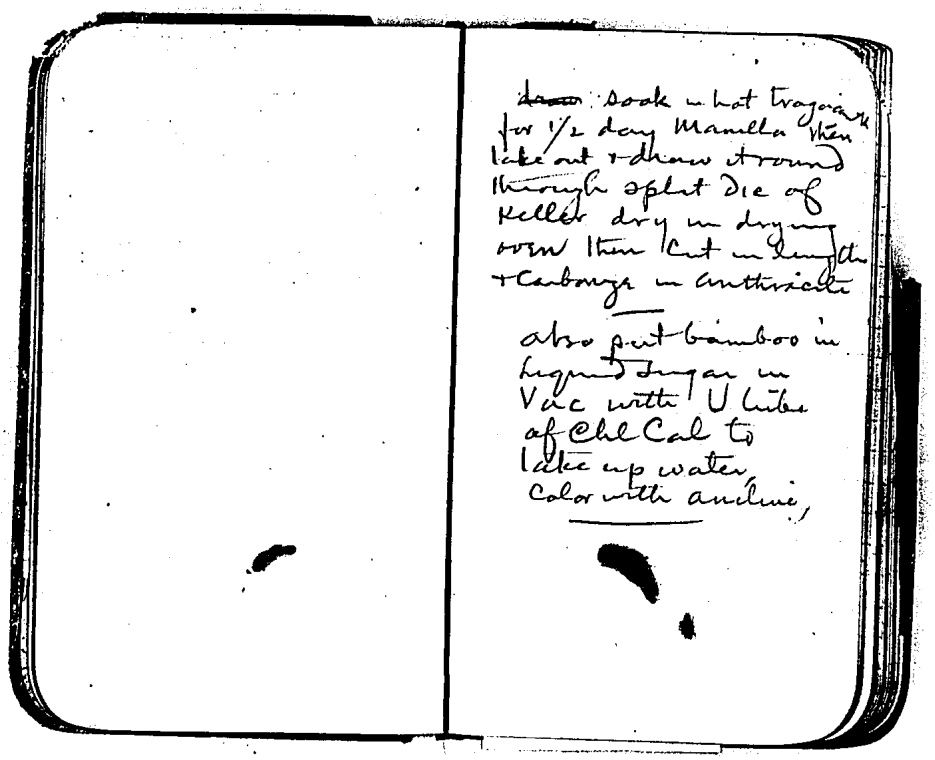
pass current through a reg carbon in air under microscope at dull red + notice oxidation

put 6 bamboo in small bulb with light capillary tip get vacuum heat it slightly then break under sugar water + while full seal + heat for 1/2 hour so as to get increased pressure -

put 6 bamboo in sealed tube with sugar + heat to 180 to 220 for 1/2 hour

Boil 12 Carbons in 1020 Solution all day.

Try Manilla for wetting use amalum + sugar

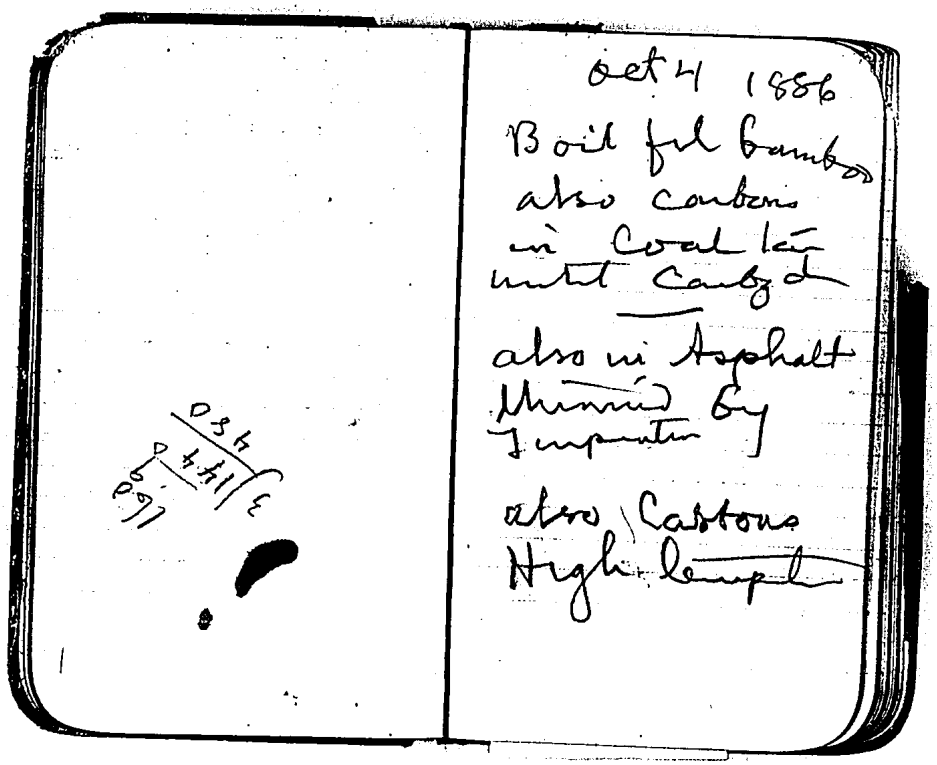


~~Soak~~ Soak in hot tragacanth
for 1/2 day Manilla then
take out + draw through
through split die of
Keller dry in drying
oven then Cut in length
+ Carbonize in antithiscle

---

also put bamboo in
liquid sugar in
Vac with U tubes
of Chl Cal to
take up water,
Color with analine,

---

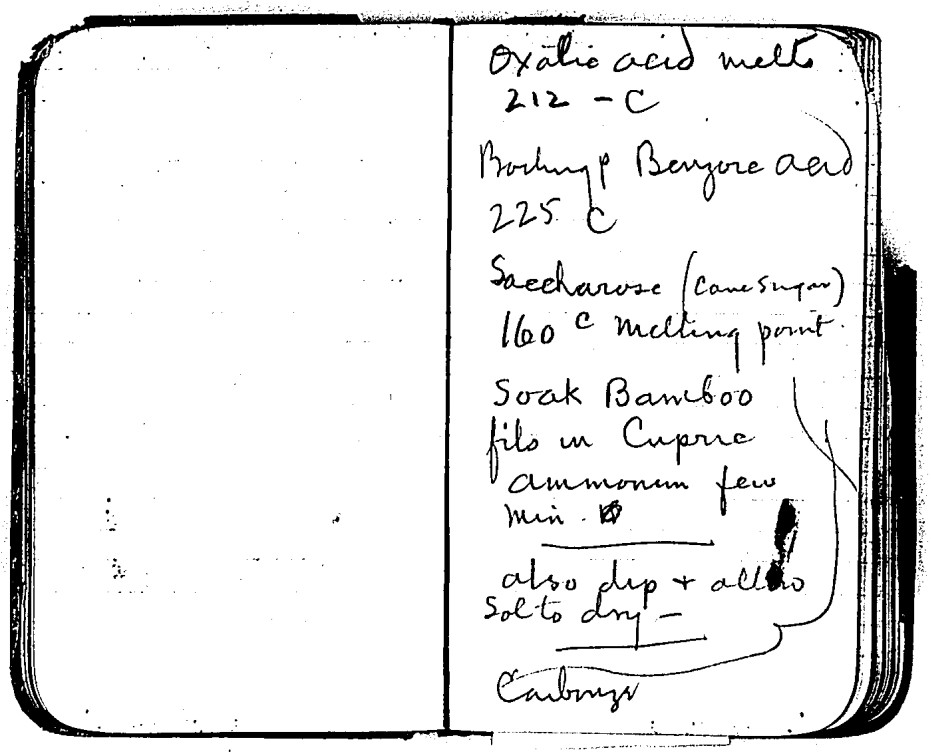


oct 4 1886

Boil fil bamboo
also carbons
in Coal tar
mixt Carbyd

also in Asphalt
Mixture by
Impuntin

also Castons
High lamp


Oxalic acid melts
212 - C

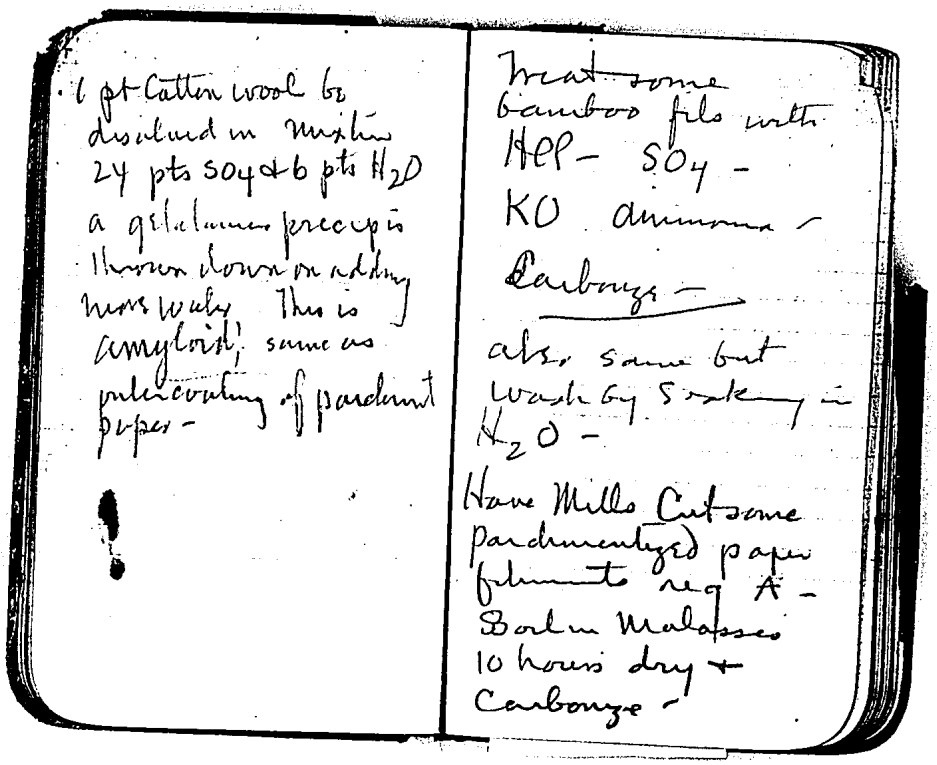
Boiling p Benzoic acid
225 C

Saccharose (cane sugar)
160 C melting point

Soak Bamboo
filo in Cuprio
ammonium few
min.

also dip + allow
Sol to dry -

Carbonyl

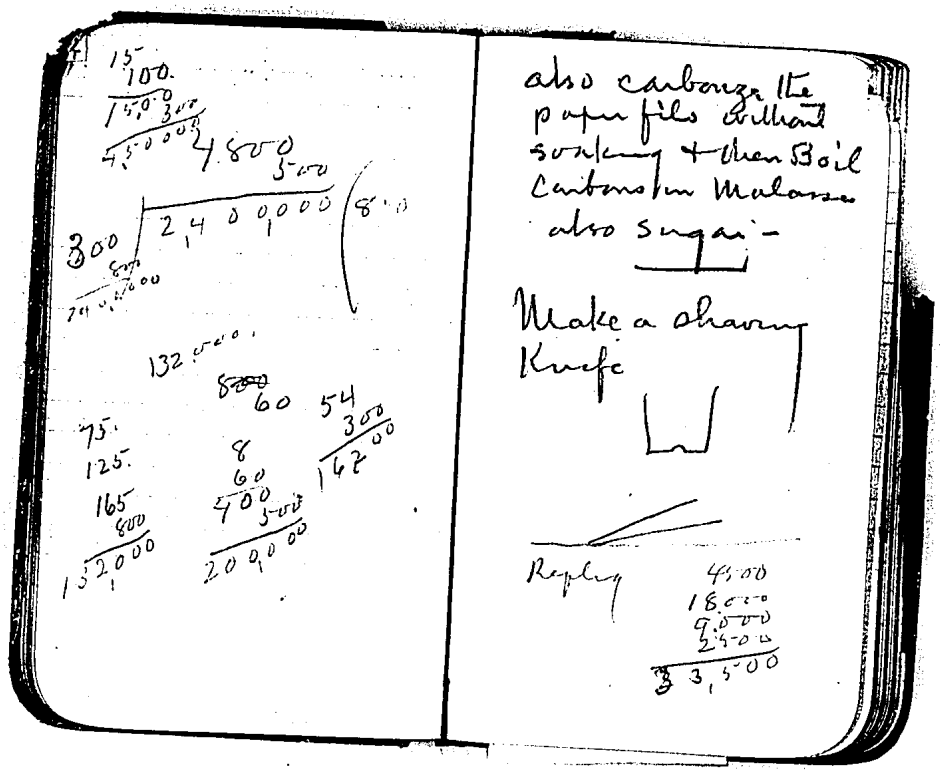


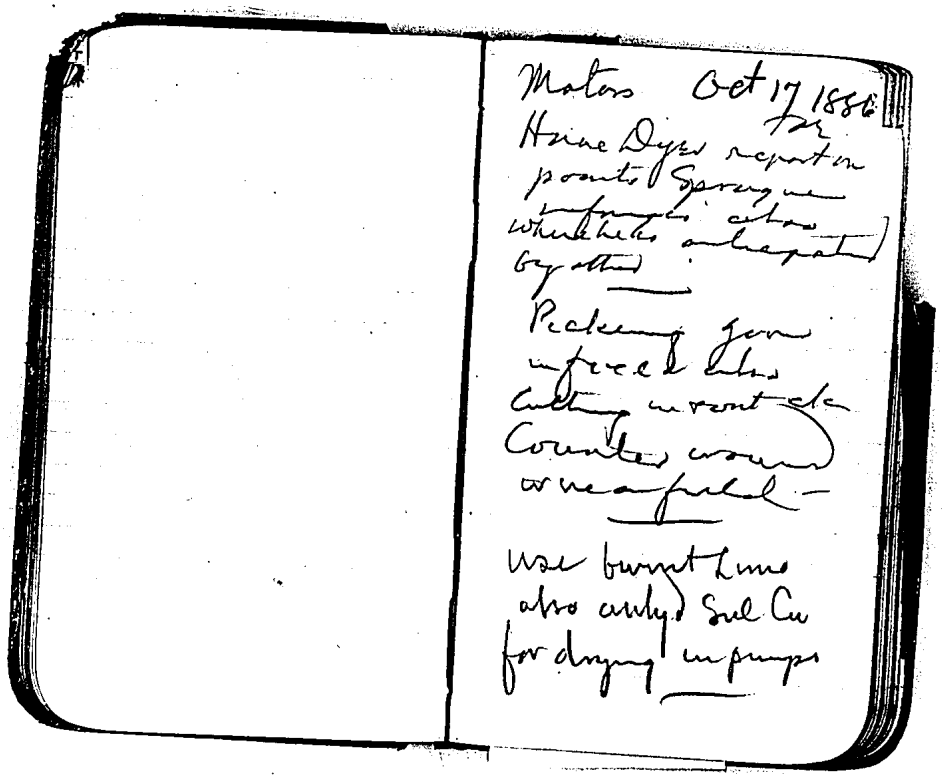
1 pt Cotton wool to dissolved in mixture 24 pts $SO_4$ & 6 pts $H_2O$ a gelatinous precipitate thrown down on adding more water. This is amyloid, same as paper coating of parchment paper -

Treat some bamboo fibs with HCl - $SO_4$ - KO ammonia - Carbonize -

also same but wash by soaking in $H_2O$ -

Have Mills Cut some parchmentized paper filaments req A - Soak in Molasses 10 hours dry + Carbonize -

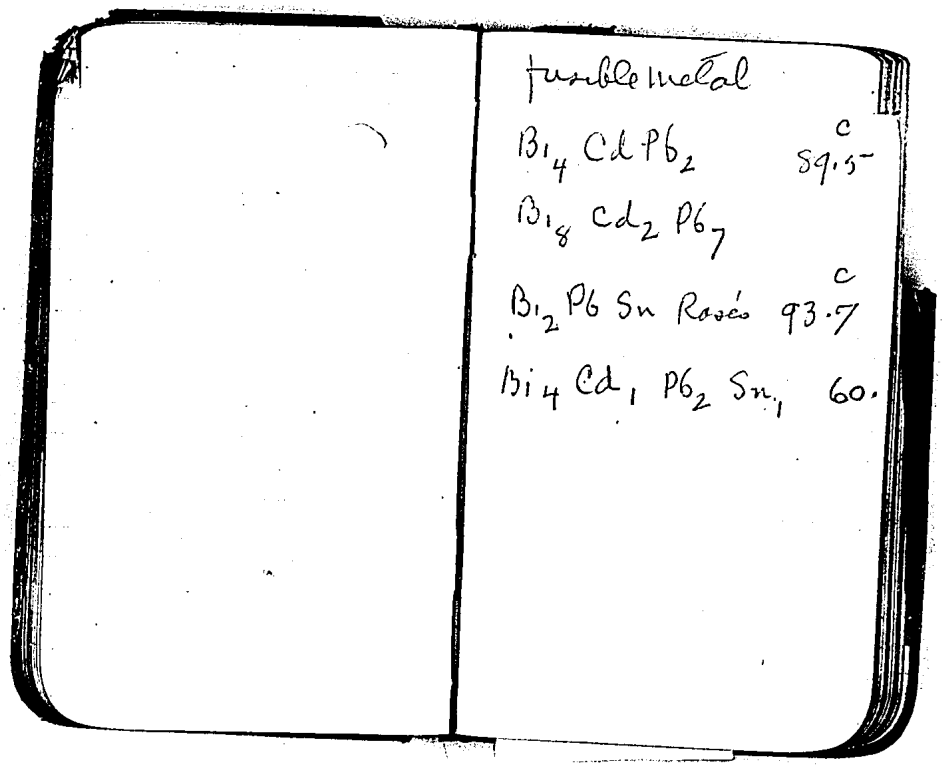

15
100.
1500
45000
4800
5.00
300
2400000
8.00
8.00
7200.00
132000.
8000
60
54
300
75.
125.
165
8
60
400
5.00
162.00
800
152000
200000
also carbonize the
paper file brilliant
soaking + then Boil
Carbonate in Molasses
also sugar -
Make a shaving
Knife
Replay
4500
18000
9000
2500
33,500



Motors Oct 17 1886
for
Haine Dyer reports
points Sprague
[illegible] also
which he has ordered
by others

Reducing gear
in feed tubes
cutting worm &
Counter wound
or near feed —

use burnt lime
also analyd Sod Cu
for drying in pumps



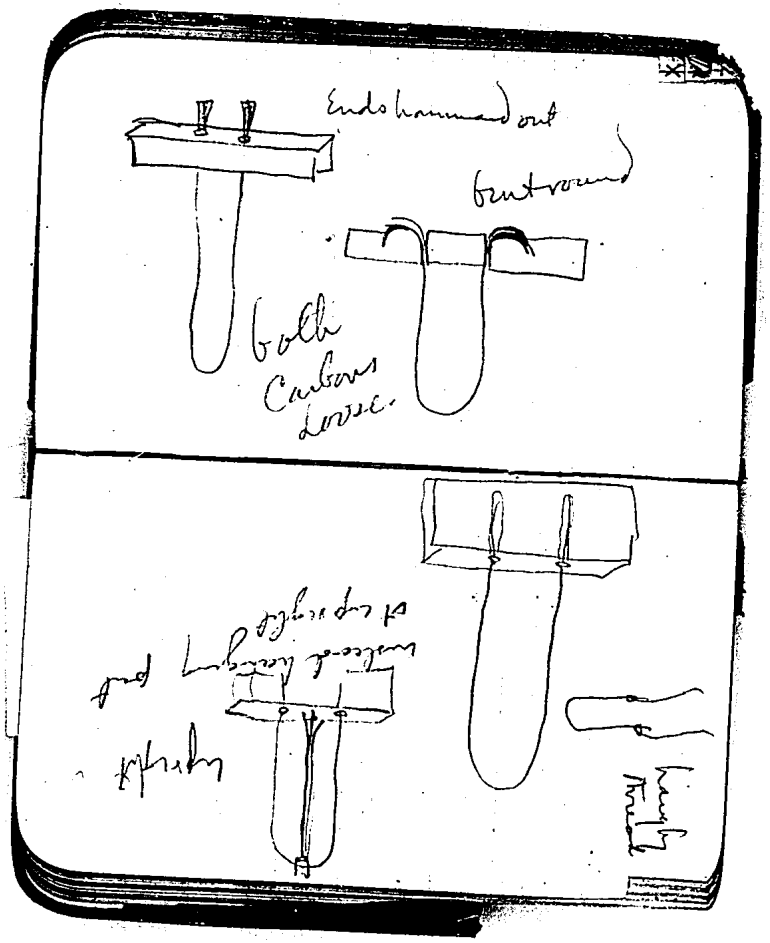
fusible metal

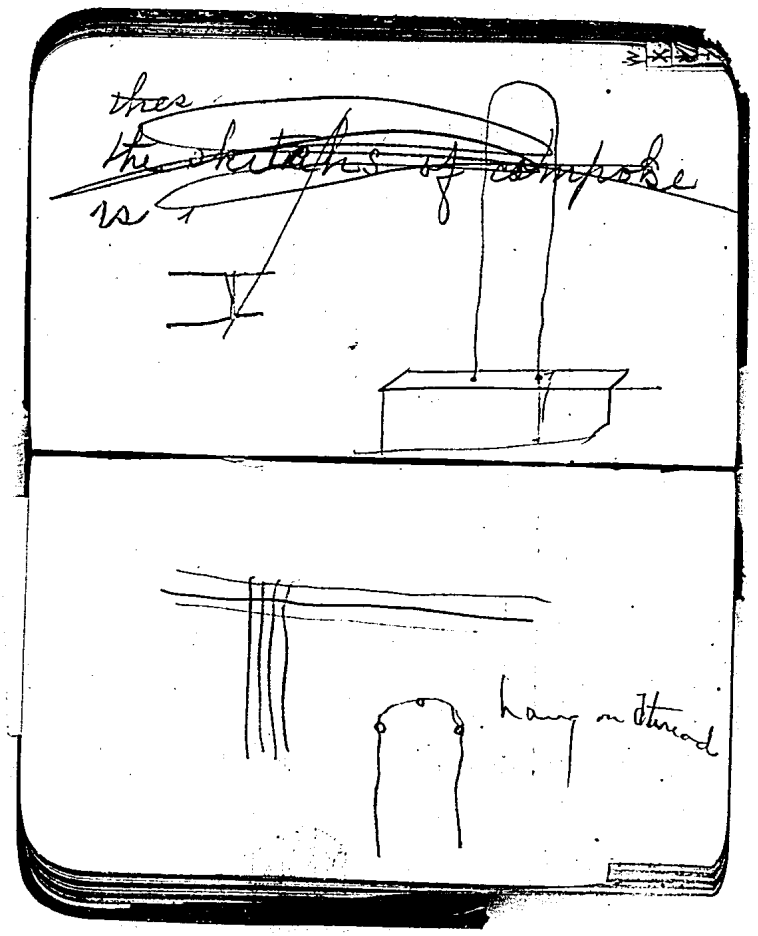
$Bi_4 Cd Pb_2$ 91.5° C

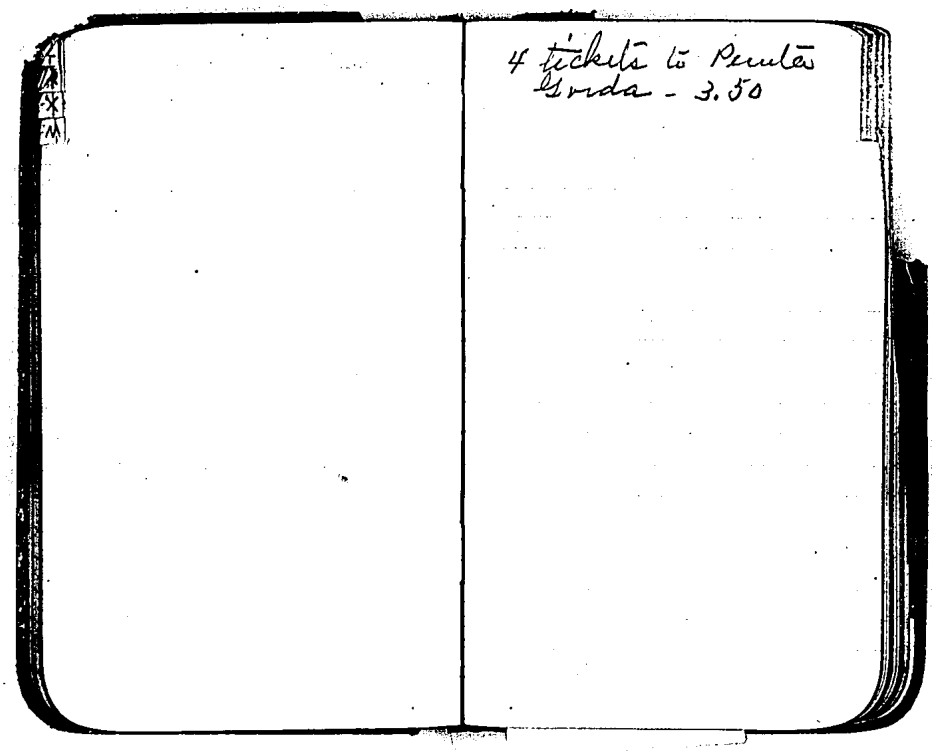
$Bi_8 Cd_2 Pb_7$

$Bi_2 Pb Sn$ Rosés 93.7° C

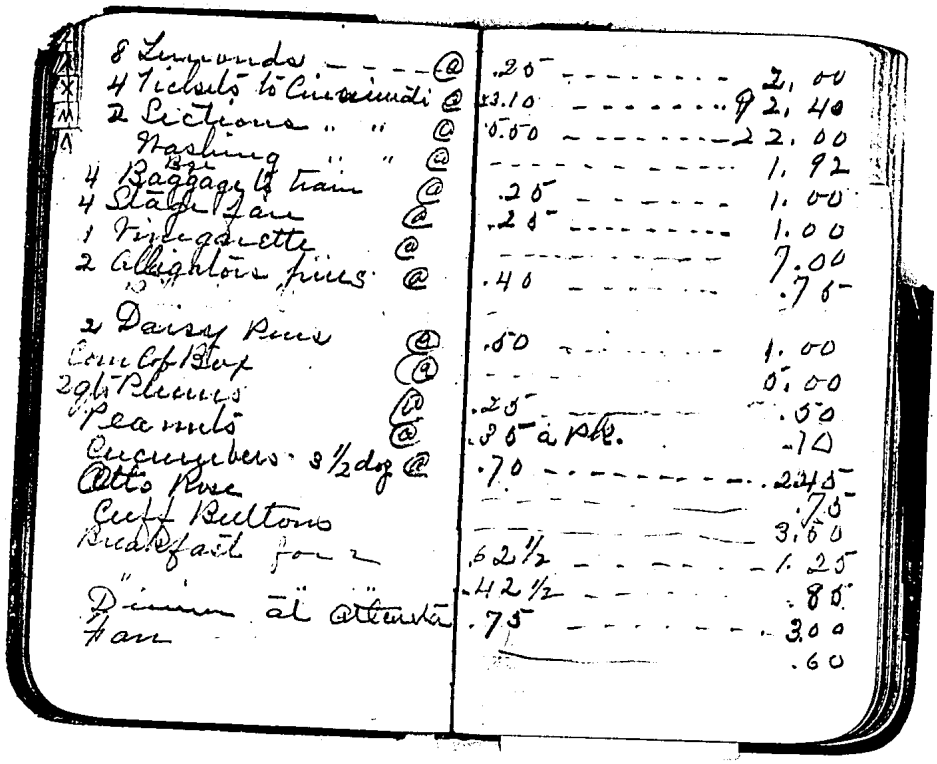
$Bi_4 Cd_1 Pb_2 Sn_1$ 60.


Ends hammered out
front round
both
Canvas
Lower

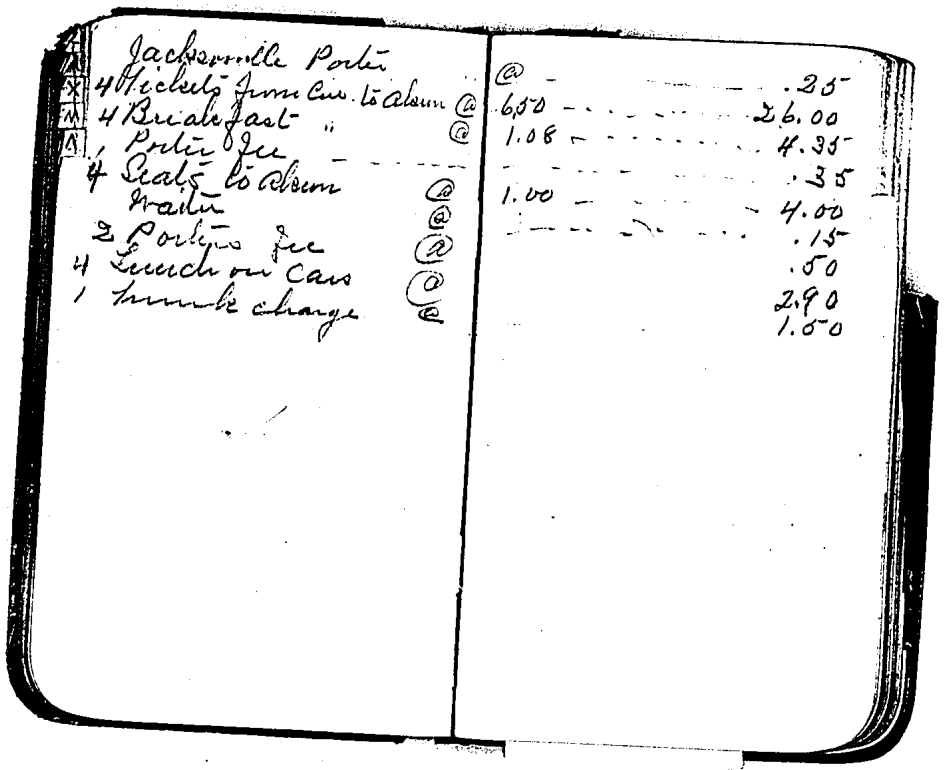

hang on thread


4 tickets to Penulas
Gruda - 3.50

| | | |
|---|---|---|
| 4 | tickets to Punta Gda | @ 3.50 ----- 14.00 |
| " | " " Jacksonville | @ 12.50 ----- 50.00 |
| " | Lower Berths to L.D. Jrin | @ 2.00 ----- 8.00 |
| " | Baggage express | @ .30 ----- 1.20 |
| " | Suitcase at Punta Gda | @ .50 ----- 2.00 |
| " | Breakfasts - Barlow | @ .50 ----- 2.00 |
| 8 | qts. Strawberries | @ .20 ----- 1.60 |
| 1 | doz. Oranges | @ .20 ----- .20 |
| 4 | days Lake Jrin | @ 3.00 ----- 24.00 |
| 4 | Tolls to station | @ .25 ----- 1.00 |
| 4 | Transfers express | @ .25 ----- 1.00 |
| " | tickets Hubbard Hotel | @ .25 ----- 1.00 |
| 6 | oranges @ 2 for | 5 .05 ----- .15 |
| | Portage | ----- .75 |
| | Cabbage for Mamma | @ 1.20 ----- 1.20 |
| | " " Cleaning | @ 6.00 ----- 6.00 |
| | Inspection | @ .10 ----- .50 |
| 4 | Shirts for Papa + Darling | 2.50 ----- 10.00 |
| 2 | Porter | ----- .50 |
| 1½ | days Hubbard Hotel | 7.50 ----- 30.00 |



| | | |
|---|---|---|
| 8 Limonades @ | .20 | 2.00 |
| 4 Nichols to Cincinnati @ | 23.10 | 92.40 |
| 2 Lichtons " " @ | 10.00 | 22.00 |
| Washing " " @ | | 1.92 |
| 4 Baggage to train @ | .25 | 1.00 |
| 4 Slabs Jam @ | .25 | 1.00 |
| 1 Tri-Gazette @ | | 7.00 |
| 2 Alleghenies pints @ | .40 | .75 |
| 2 Daisy Rums @ | .50 | 1.00 |
| Can Coffee @ | | 0.00 |
| 2 lb Prunes @ | .25 | .50 |
| Peanuts @ | .30 a lb. | .10 |
| Cucumbers 3 1/2 doz @ | .70 | 2.45 |
| Attic Rice | | .70 |
| Cuff Buttons | | 3.00 |
| Breakfast for 2 | 62 1/2 | 1.25 |
| " " 1 | 42 1/2 | .80 |
| Dinner at attendt | .75 | 3.00 |
| Ham | | .60 |

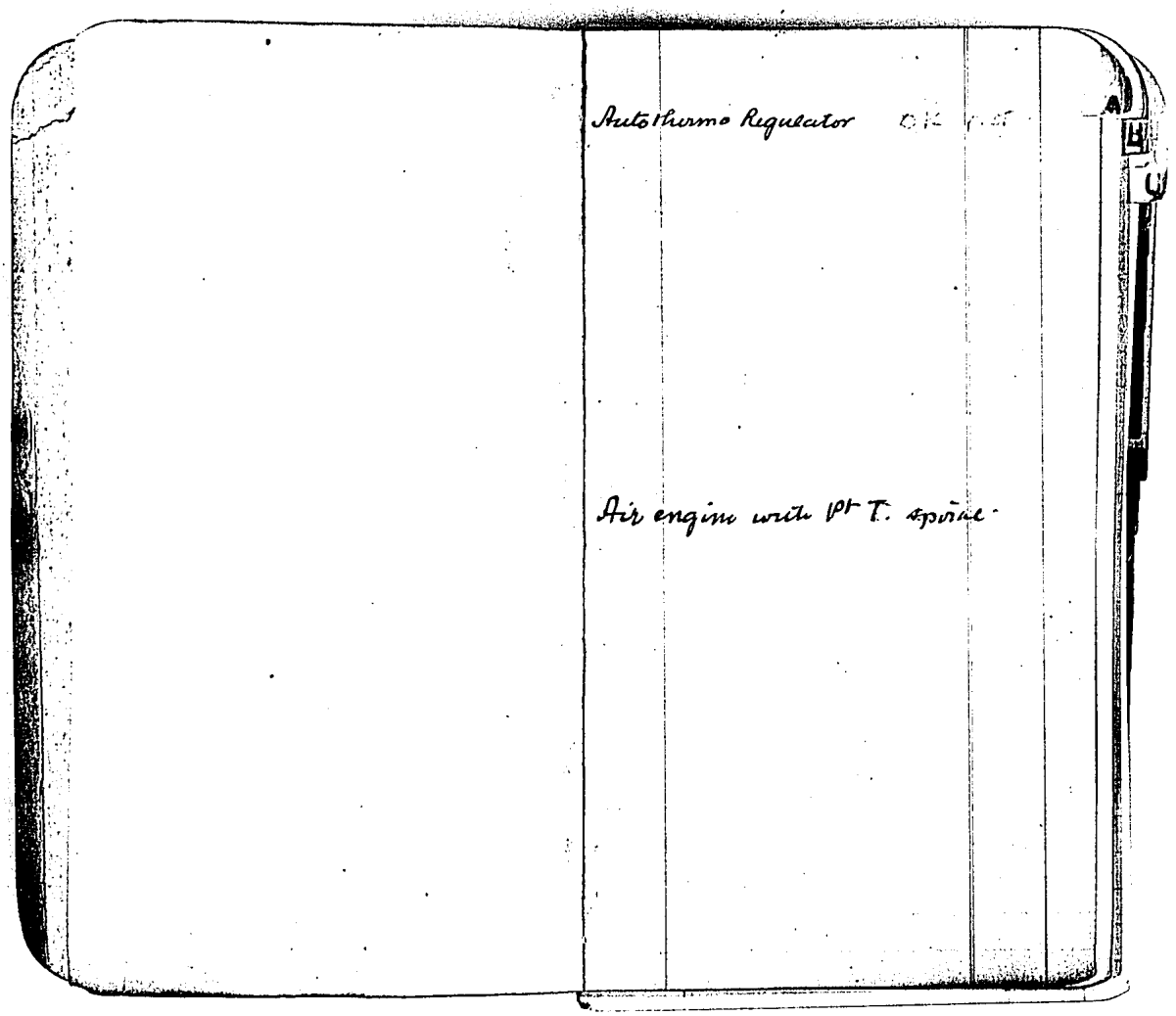


Jacksonville Porter

| | | |
|---|---|---|
| 4 Tickets Jam Cus. to Alsum | @ | .25 |
| 4 Breakfast " | @ | 6.50 |
| 1 Porter fee | | 26.00 |
| 4 Seats to Alsum | @ | 1.08 |
| Train | @ | 4.32 |
| 2 Porters fee | @ | .35 |
| 4 Lunch on Cars | @ | 1.00 |
| 1 Transfer charge | | 4.00 |
| | | .15 |
| | | .50 |
| | | 2.90 |
| | | 1.50 |

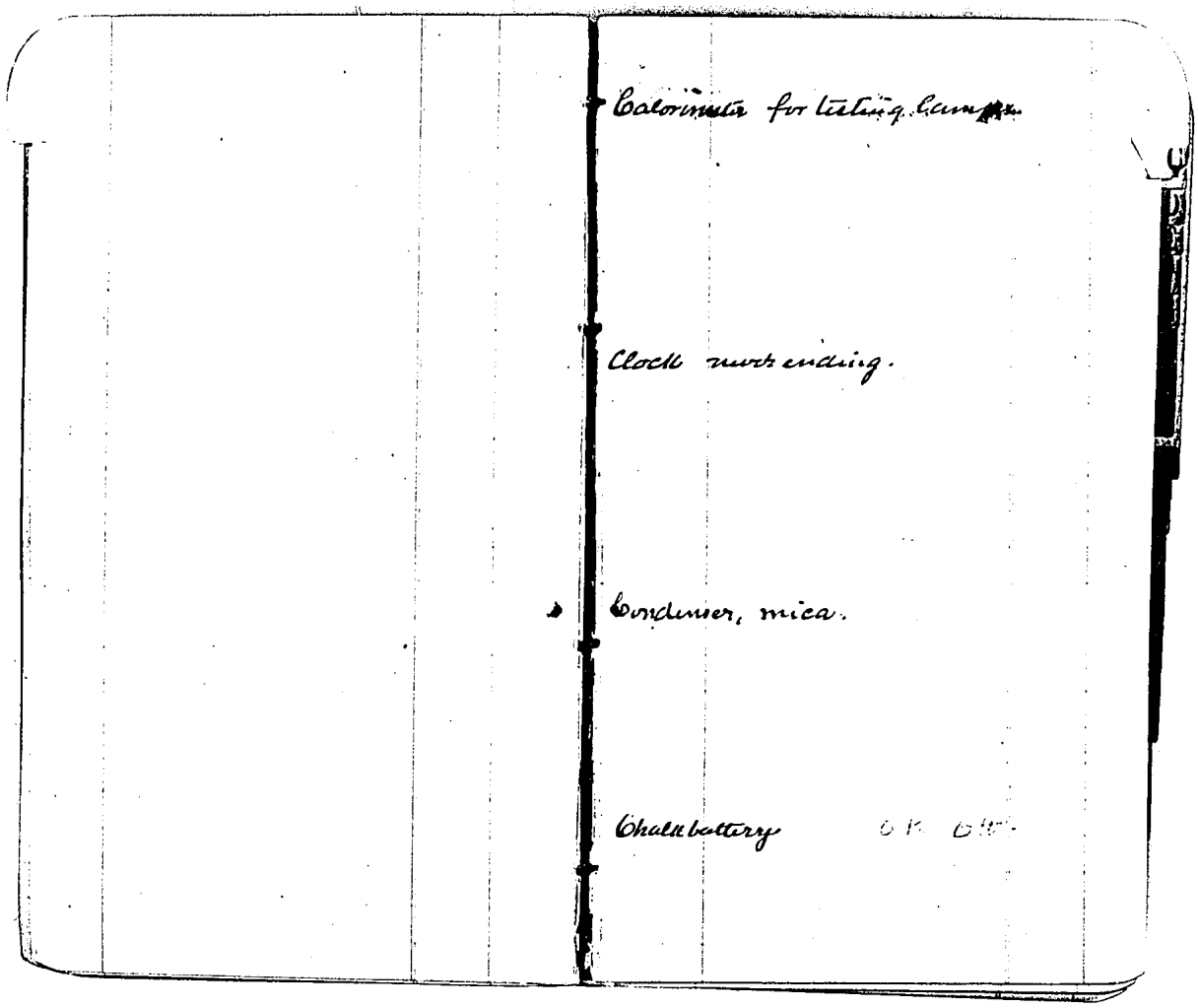
## Pocket Notebook, PN-80-00-01

This undated pocket notebook contains lists of devices, ranging from chalk batteries, electric fans, and lamps to exotic items such as an "odorscope." Some of the listings are accompanied by drawings. The entries are in the hand of Charles Batchelor. They are arranged in alphabetical order, and many of them are initialed by John F. Ott. The front cover is labeled "156." The pages are unnumbered. Approximately 25 pages have been used.


Auto thermo Regulator
Air engine with Pt T. spring.

Bamboo, all shapes, ales paper.

Balance, counter for magnets.


Calorimeter for testing Gum &c.

Clock work winding.

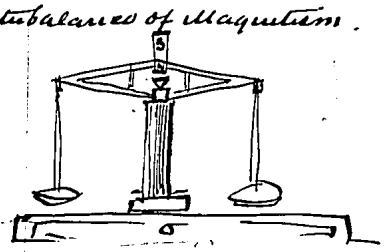
Condenser, mica.

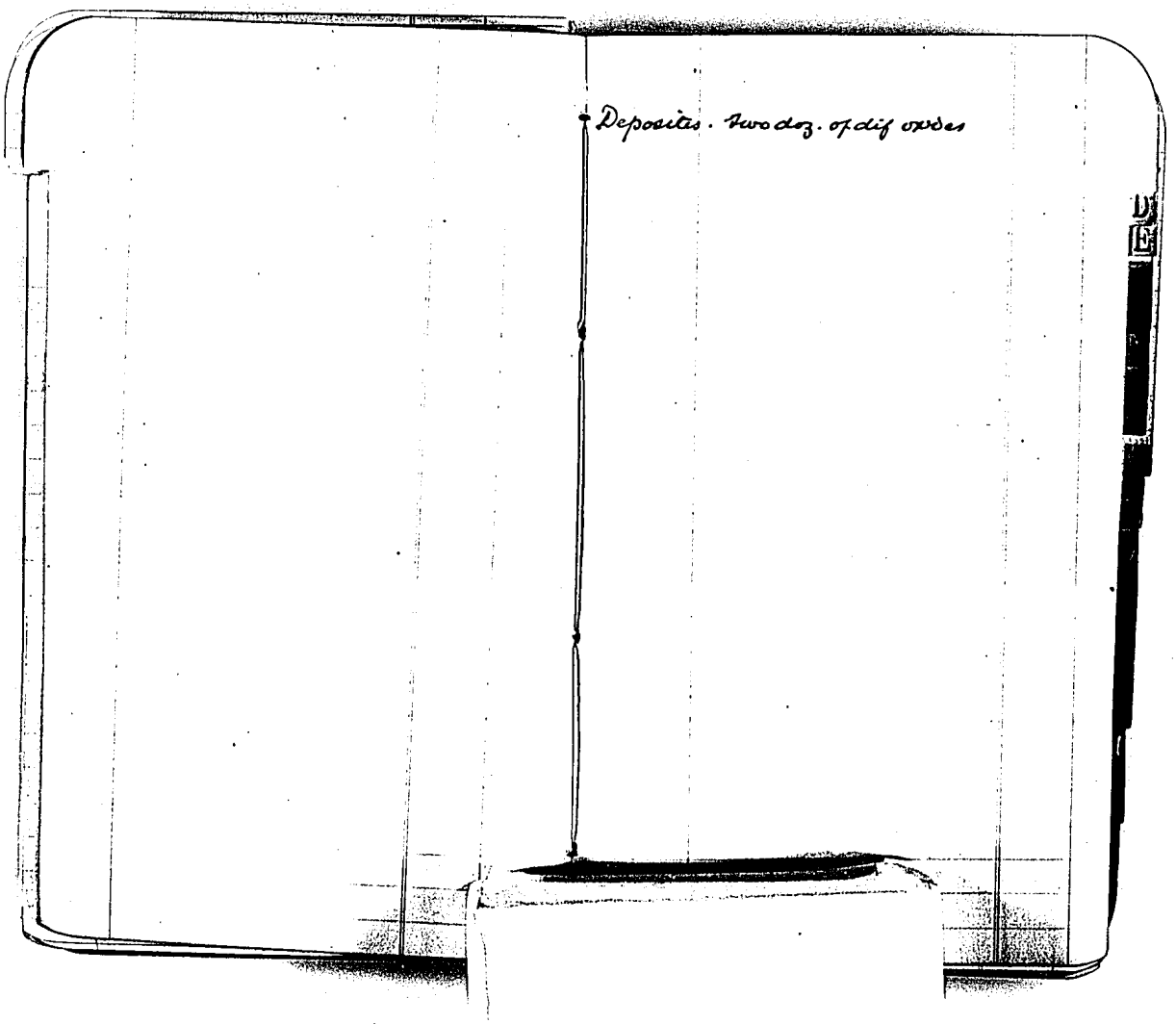
Chalk battery

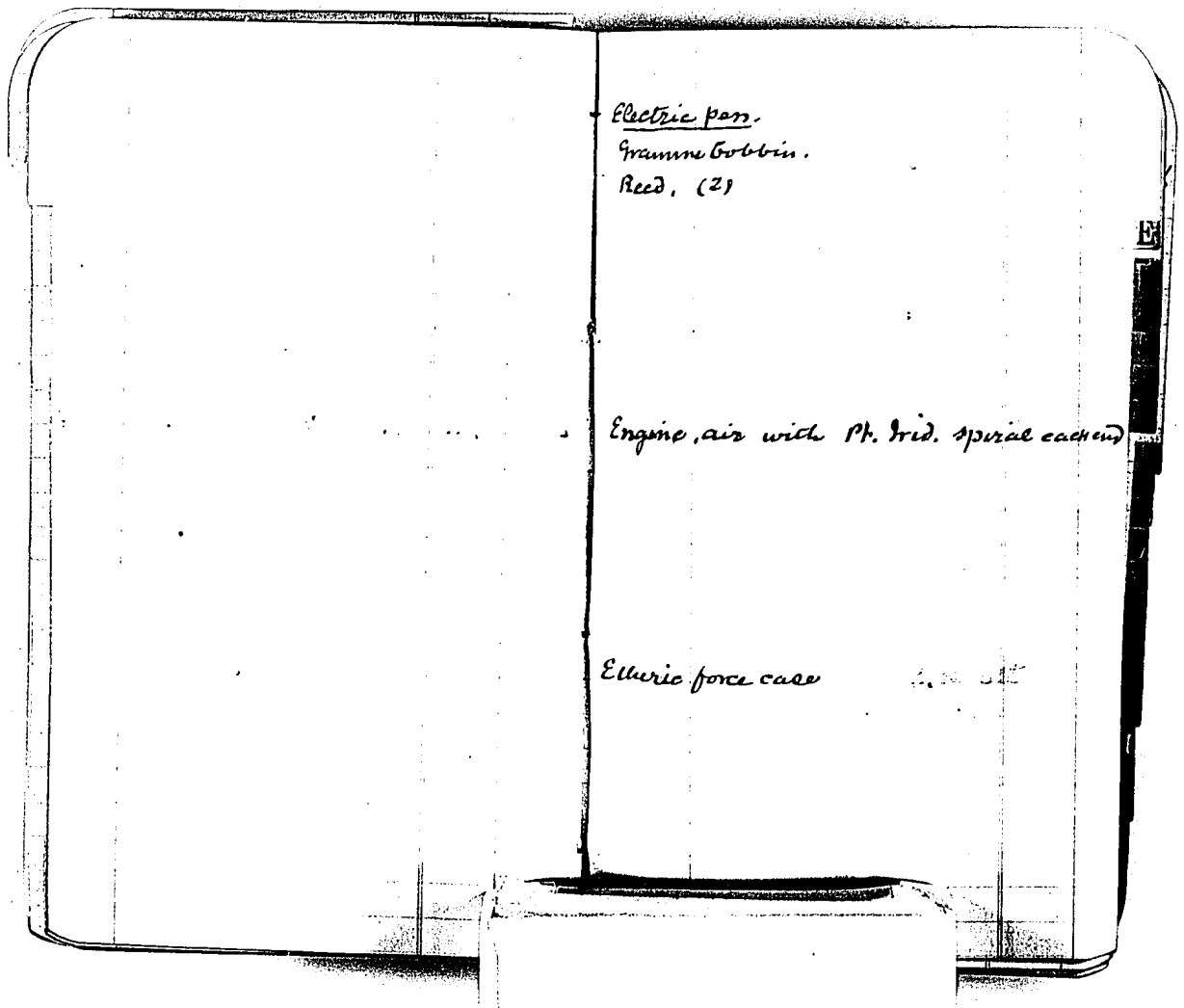
Cigar, Cigars

Carbon, case of including Graphite

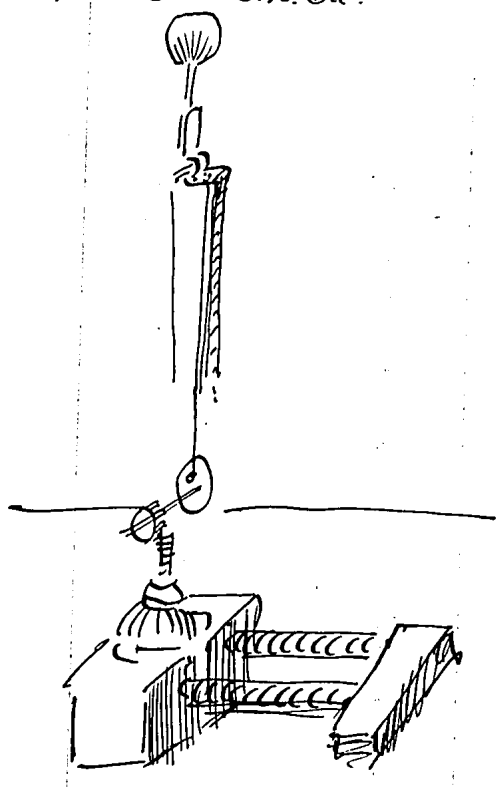
Counterbalances of Magnetism.

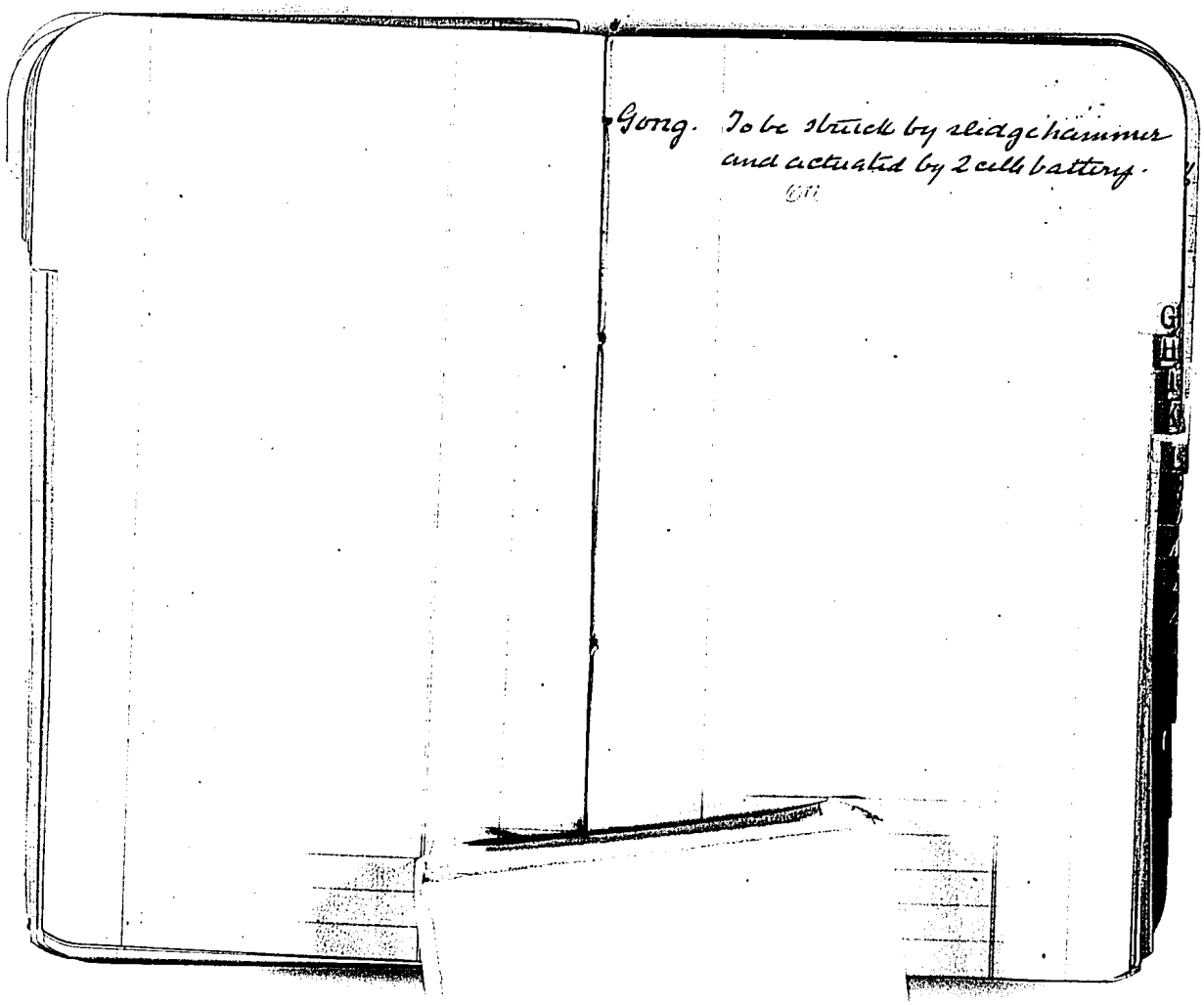



Deposits. Two doz. of dif oxides


Electric pen.
Gramme Bobbin.
Reed. (2)
Engine, air with Pt. Irid. spiral cooling
Elleric force case

Fan, electric O. K. Ott.



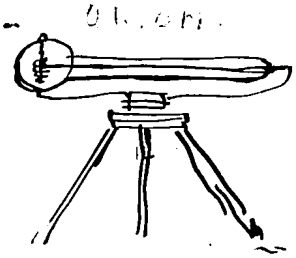


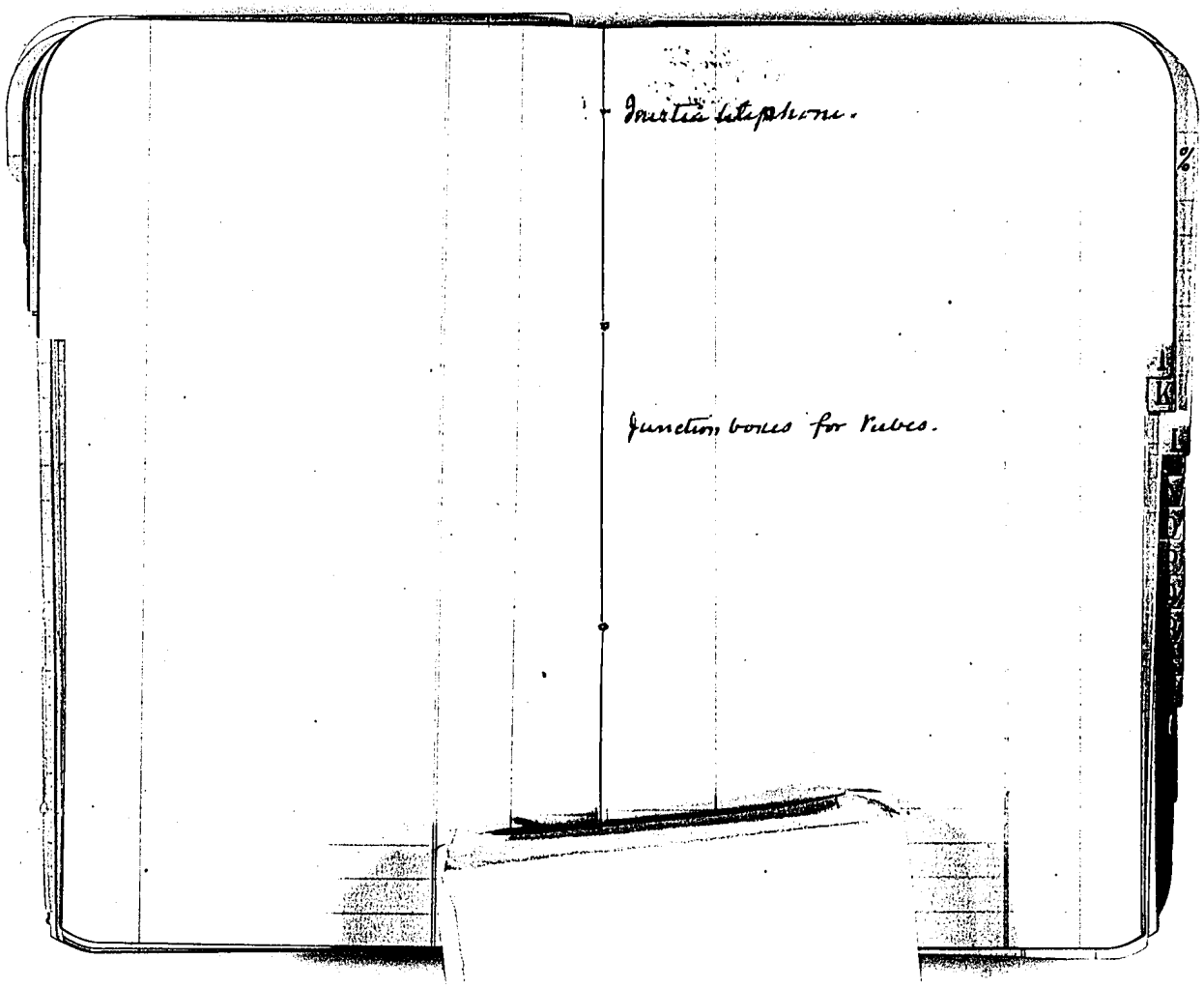
Gong. To be struck by sledge hammer and actuated by 2 cells battery.

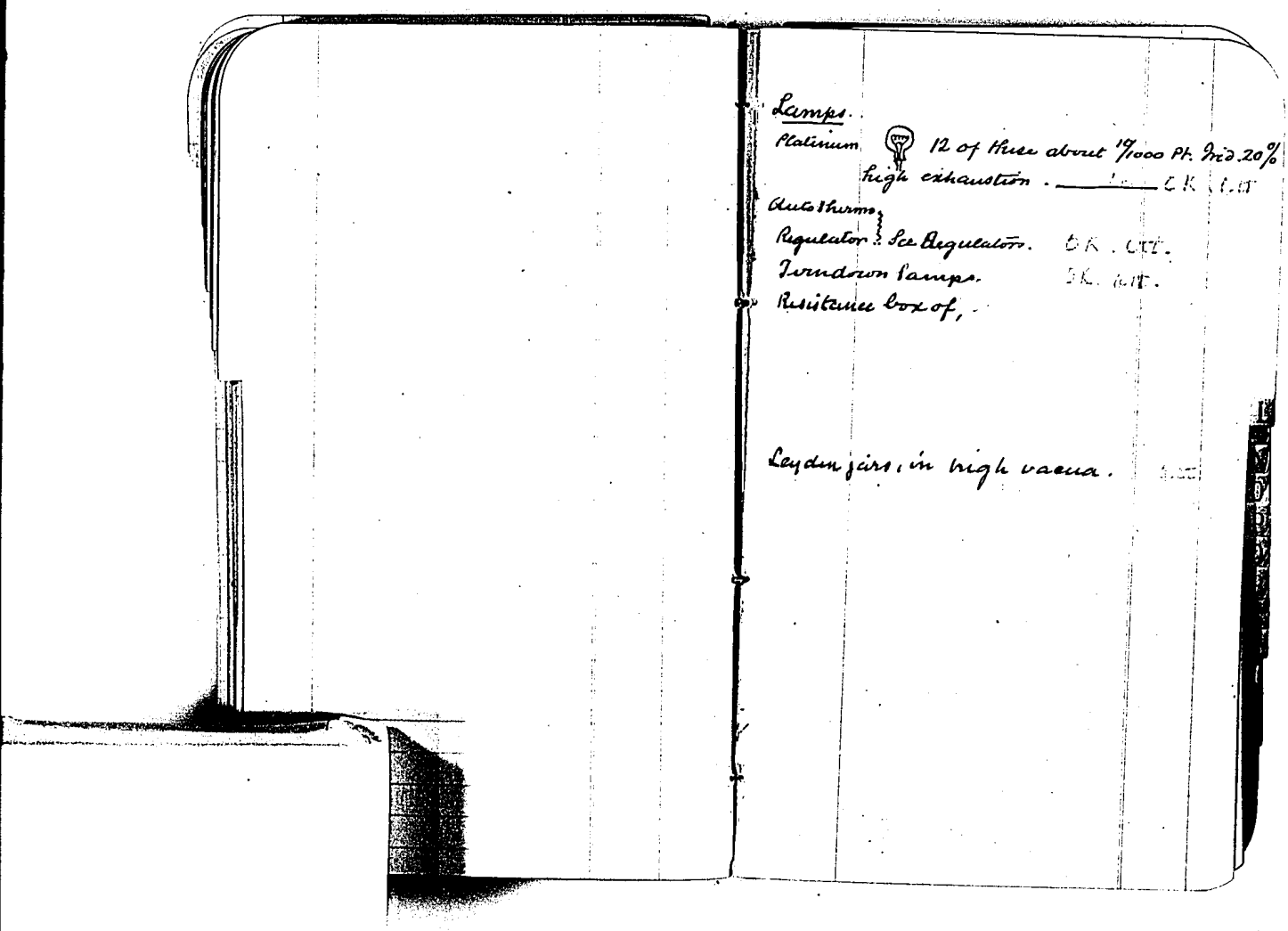
Galvanometer

Motographie a

Thermo. z




Inertia telephone.
Junction boxes for tubes.



Lamps.

Platinium  12 of these about 1/1000 Pt. Ind. 20%

high exhaustion. _____ D.K. C.U.T.

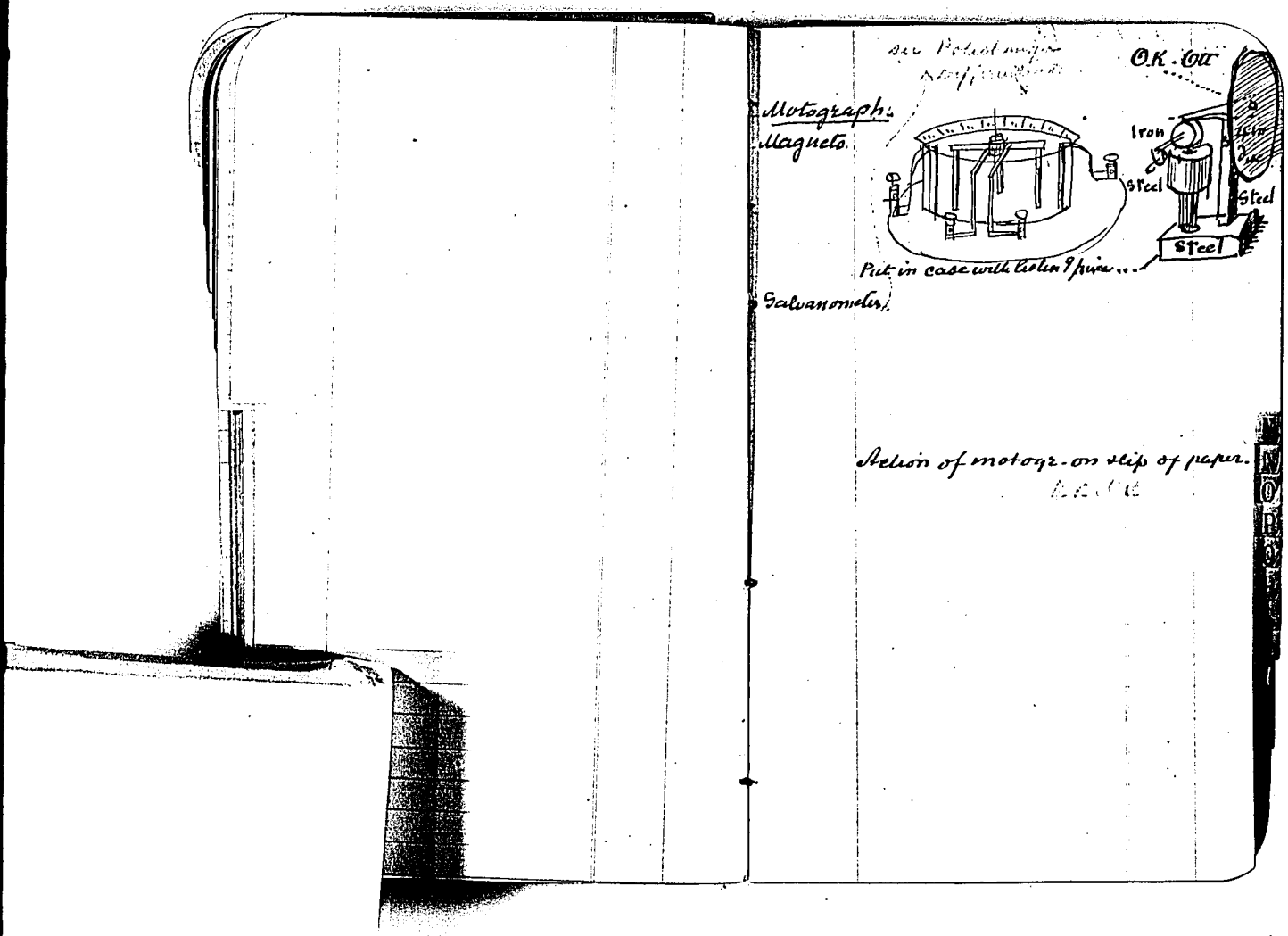
Auto Thermo Regulator } See Regulators. D.K. C.U.T.

Turndown Lamps. D.K. C.U.T.

Resistance box of,

Leyden jars, in high vacua.

/



See Polarized magnet Amplifier

O.K. Oil

Motograph:
Magneto.






Put in case with Leclanché jars...

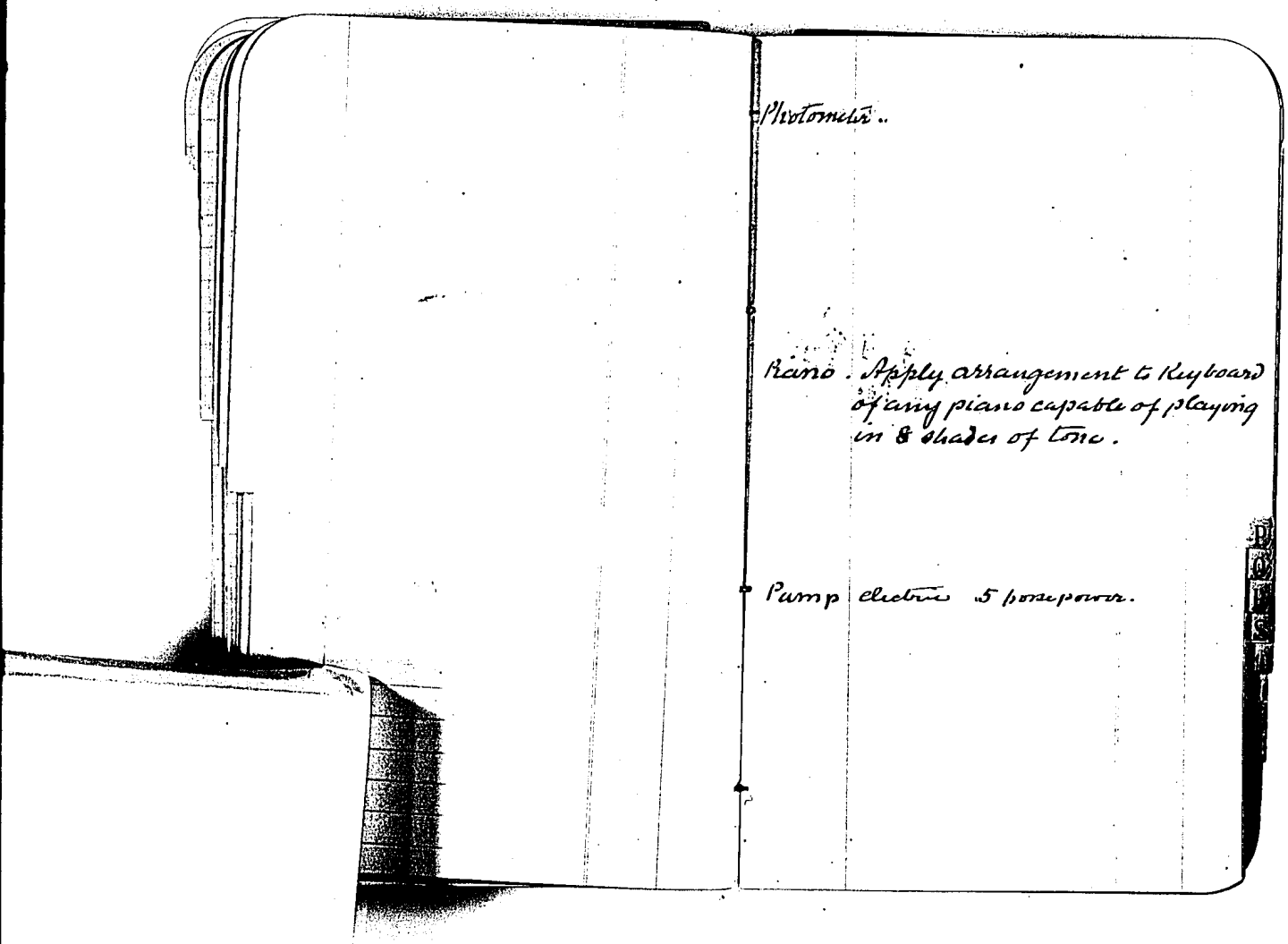
Galvanometer.

Action of motogr. on slip of paper.

/

Microphone, les Transmitters. [illegible]

/

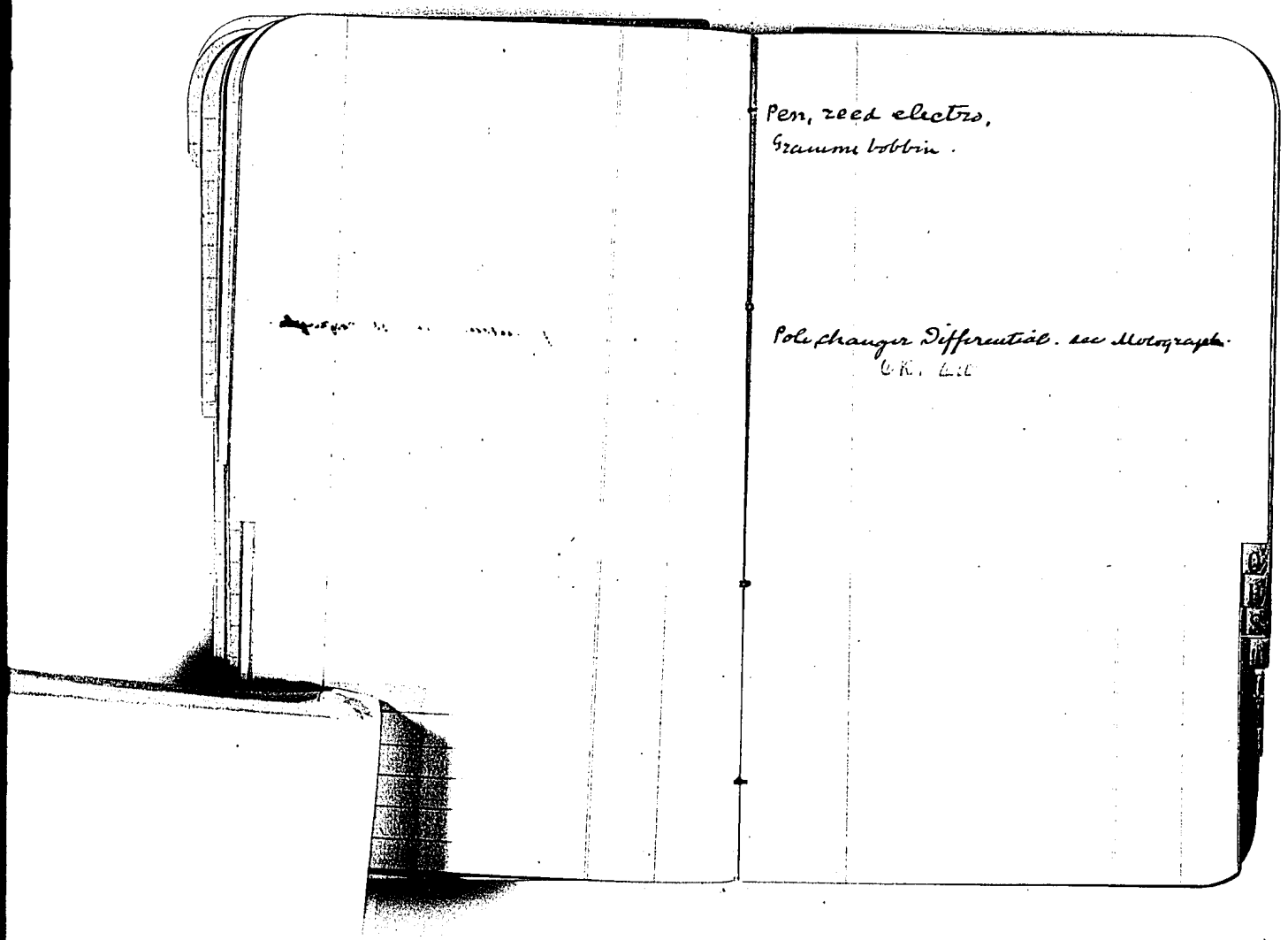


Photometer..

Piano. Apply arrangement to Keyboard of any piano capable of playing in 8 shades of tone.

Pump electric 5 horsepower.

/



Pen, reed electro,
Gramme bobbin.

Pole changer Differential. see Mirograph.
C.K. L.C.

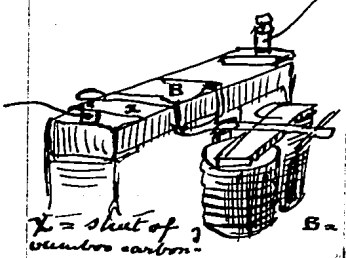
/

*Relays*

Expansion Auto press, such as was used to run the electric pen.

*Repeater, telephone.*

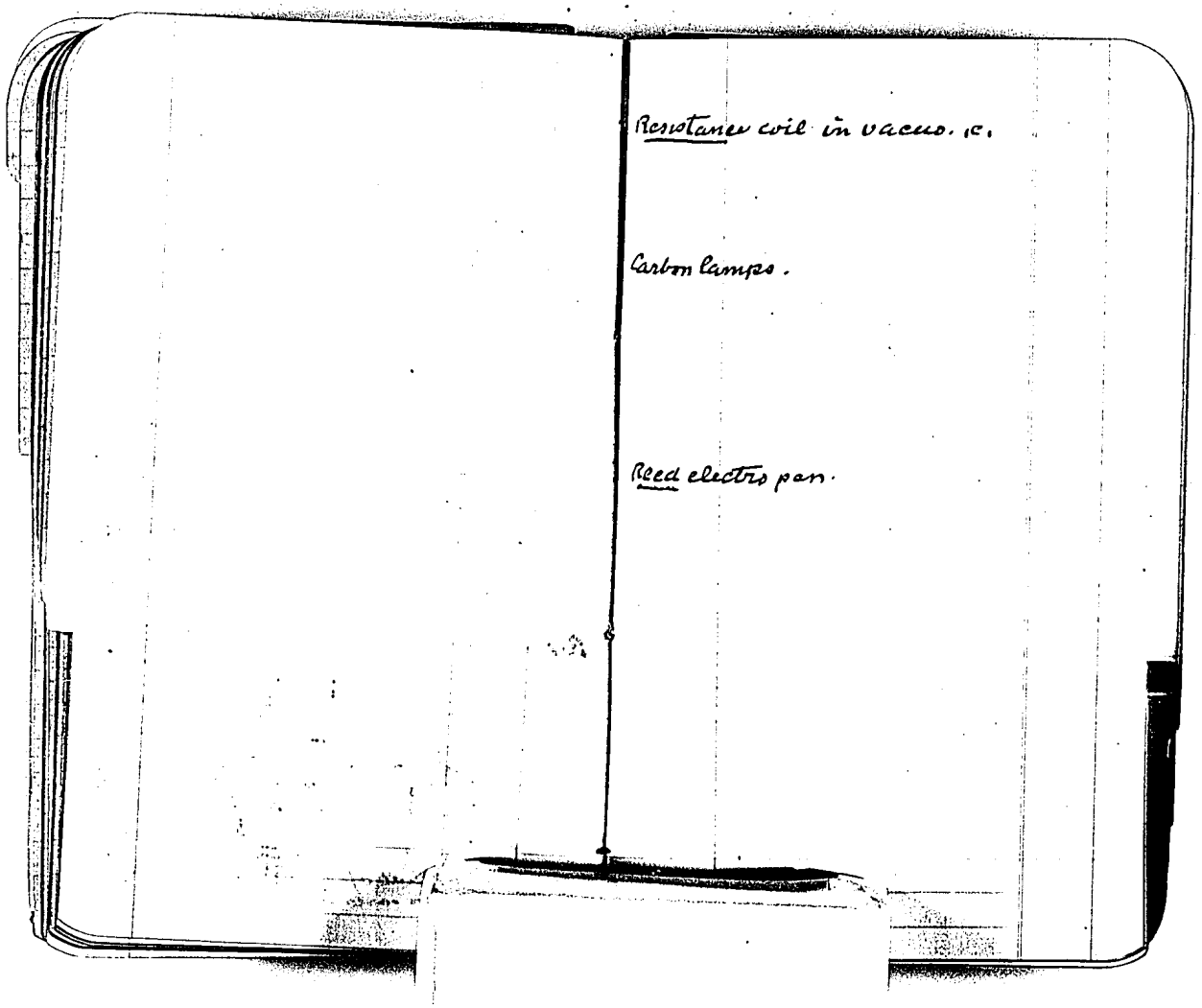
*Resistance, variable.* C. H. Ott.




S = slant of vanadium carbon

B = spring

/

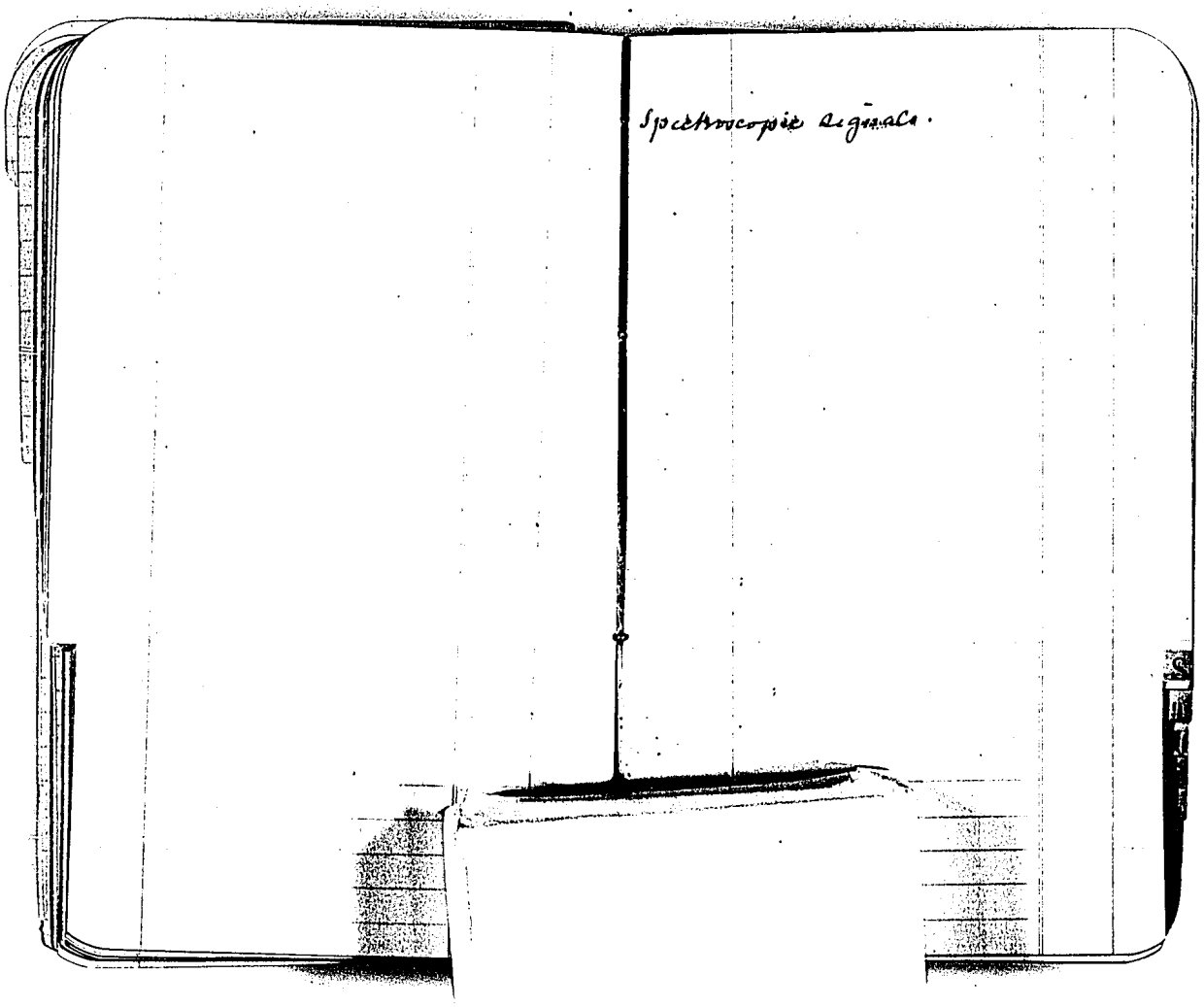


Resistance coil in vacuo. &c.

Carbon lamps.

Reed electric pen.

/


Spectroscopie réglable.

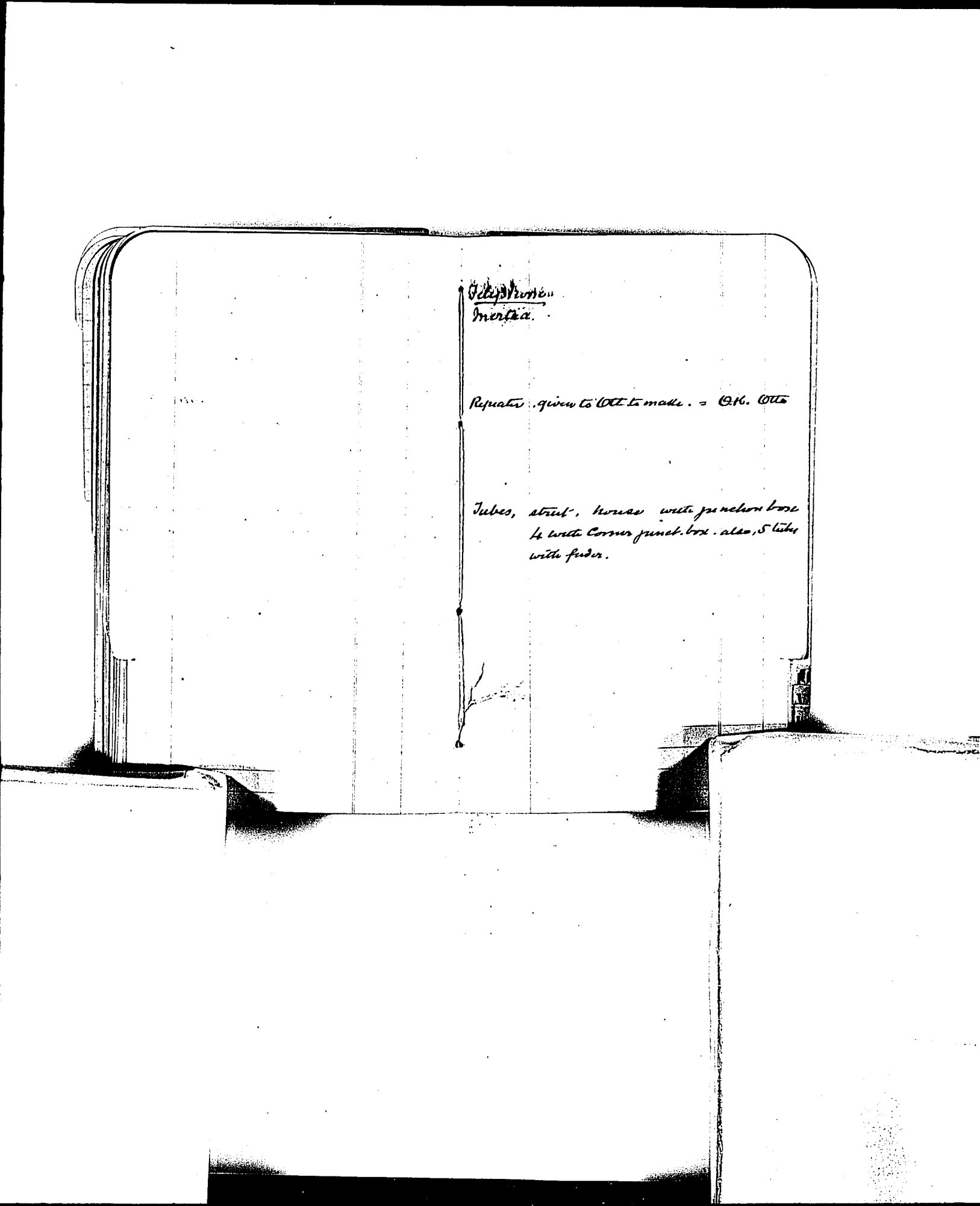
Tasimeter.

Odoroscope.. Coat the expansible rod which presses on carbon button with a substance, and shake a cloth wet with another substance in which the first is soluble, and a pressure is exerted on the button ? to detect odors.

All substances are transparent to Radiant heat; - A plate of iron will allow it to pass in right lines. —

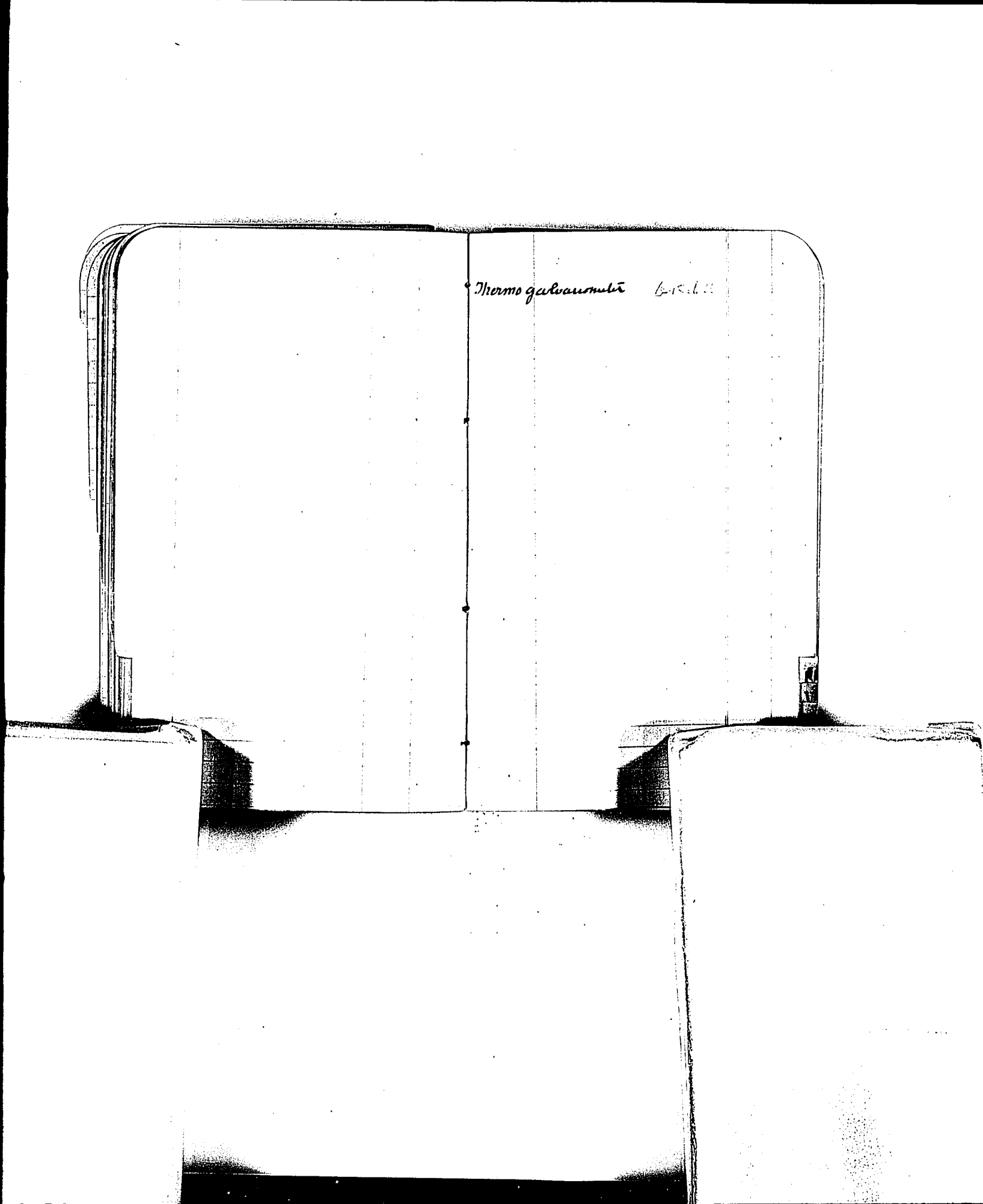
Experiment at Rawlins. Radiant heat finds its way across a vessel containing ice. —

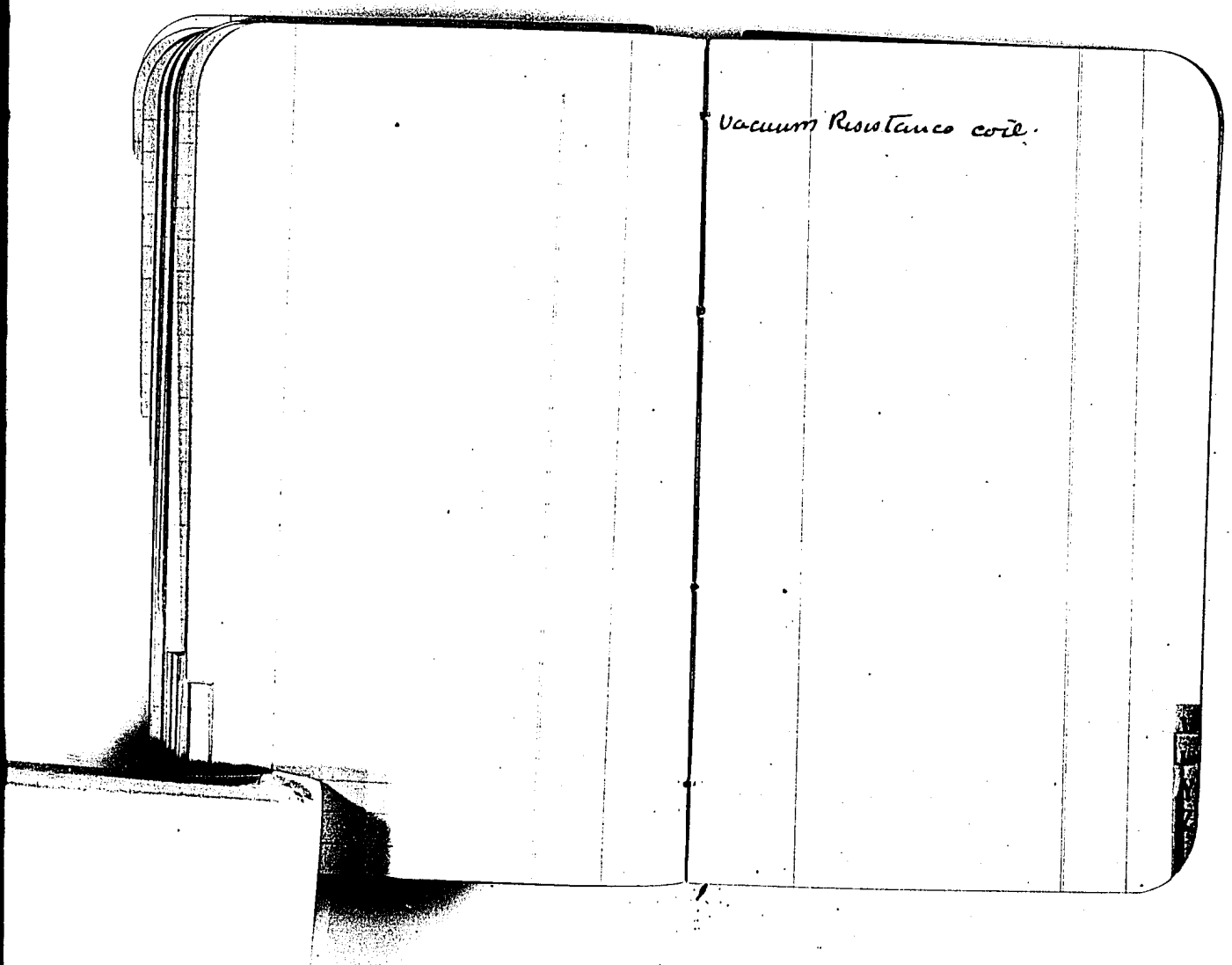
Arrange a concave mirror on the end of a tuning fork and throw the beam from a source of heat on the sensitive pile


Telephone
Inertia.
Repeater. given to Ott to make. = O.K. Otto
Tubes, strut, horns with parchment base
& with Corner funnel box. also, 5 tubes
with feeder.

Transmitters.

Microphonic all varieties


Thermo galvanometer


Vacuum Resistance coil.

**Pocket Notebook, PN-86-00-00.3**

This undated pocket notebook contains notes and drawings by Edison relating to lamp experiments. The pages are unnumbered. Only 7 pages have been used.

PN-86-00-003

Found in letter box
to be filed "Notes"

GEO. W. PERTAIN,
Stationer & Printer,
47 Exchange Place,
New York.

Possibly trenches in Fig 1.

Thick dip rendered negative by pressure marks. Dry Curve on top mould showing no marks. ①
noticed Ed had ~~no~~ marks.
Sheets absorb too much $CO_2$ $H_2O$ etc
notice bad results Charcoal Carbon
dip sheets gasolene to displace $H_2O$ etc
see if gasoline offset 17. or Kero,

Perhaps 2nd prelim too slow
17 goes off -

Try dipped dried then fumes
$NO_3$ -

Wrap Cat around cloth ~~and not~~
paste side moulds -

Study their dips -

Increase heat of dip to 130° or
higher to get thicks - dry 170°
& take pressure off -

Carbonize some in grooves in Carbon ~~bar~~ hot dip –

Run to 5:00 and hold only ½ hour then hot dip + run up in 1 hour hold ½ on 2nd =

---

See if Carbons ∏ as Ed was

---

Try Curve in 60x Dixons flake p 690 also Electrotypers =

Send out how No 16 was run –

Try bunched say 200. with paper outside and wound with Linen thread string. and run clean to final not taking them from prelim to dip Grit after Carbonized dip and heat to 175° then in sheets + prelim in 1 hour holding ½ + then final. also try bunching dipped prelim 200 + wrapped thread see if okeh

Have Drahler Duplicate 10 on the transformer =

10 Lamps Coiled anhy $SO_4$ – just dip in $H_2O$ mulant, then when on pump bring up through 40 Lamps

10 Lamps with drop anhyd $SO_4$ on ends of bulb just before sealing in – stop acetylene =

Have Drahler Test drop CP on 90 deg Lamps may be they hold up better hence lower life =

Try $SO_4$ thing in Cups mulcoid plus anhy – 1 also both together

See how much Current can be passed through foil which is made part = Conc SO4 - wetted 0×93 Then Current say 1 amp may do something =

May be effects gets gradually oxdyd + become rough + fill Cant decide -

Use micro + pick out 10 dented + 10 not dented

also ten with silver shine

also 10 by heavy weight

10 with Maximum harm

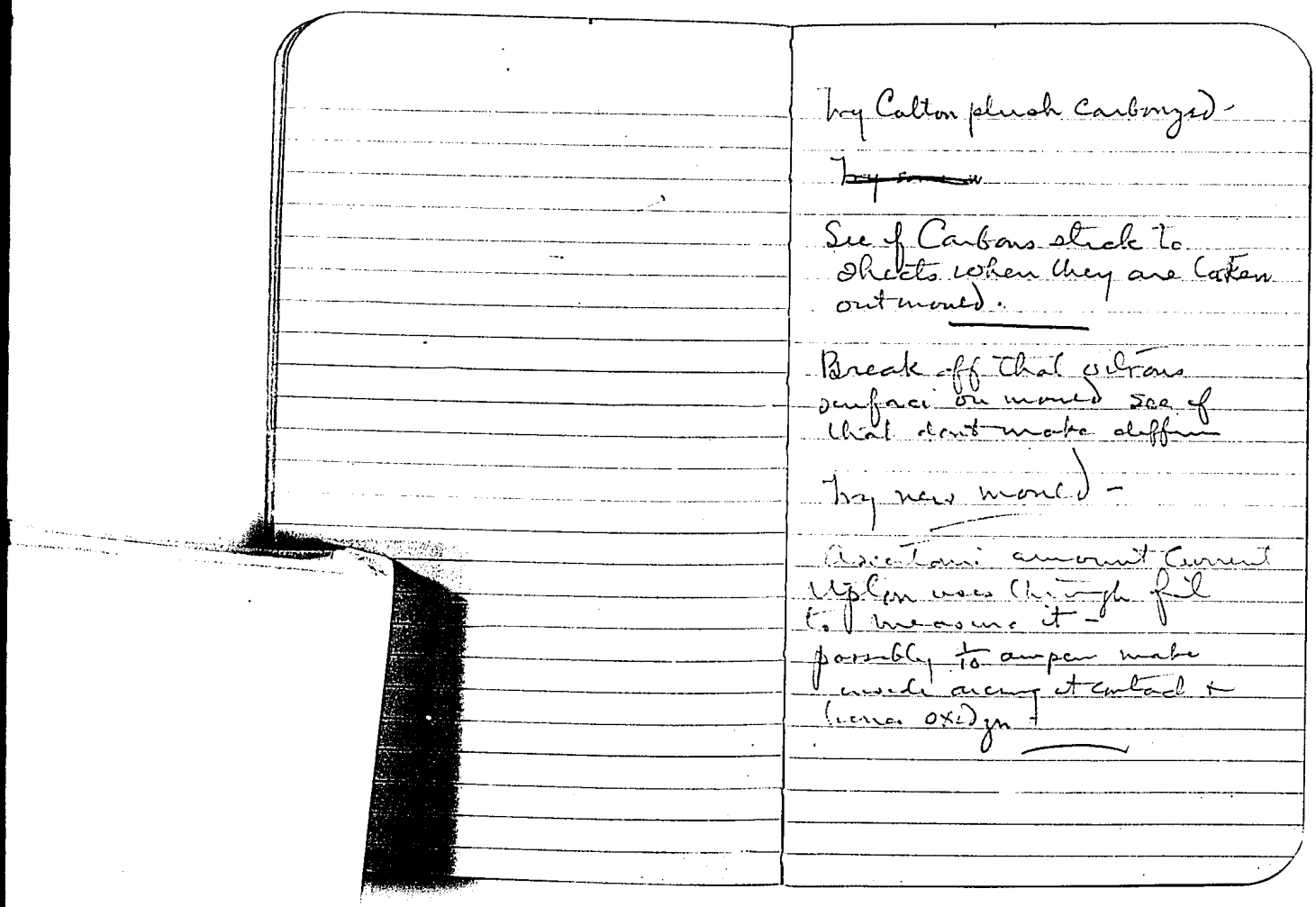
Carborundum tissue paper by Gelvacon cloths

plumbago 1/2 doz sheets previously dipping in very thin Distilled water + drying moderately + before dry brush plumbago over = Run Curve -

Heat pelvis plunge into 17 verbally so 17 runs up into path pores which are large when looked End on Drain take out Rinse Temp + put on to and for req dip.

Bend 10 Carbons various ways Run Curve may be 17 surface Cracks in hardening.

Bend foil under Micro see if Crax can be seen



Try Cotton plush carbonized -

~~Try same~~

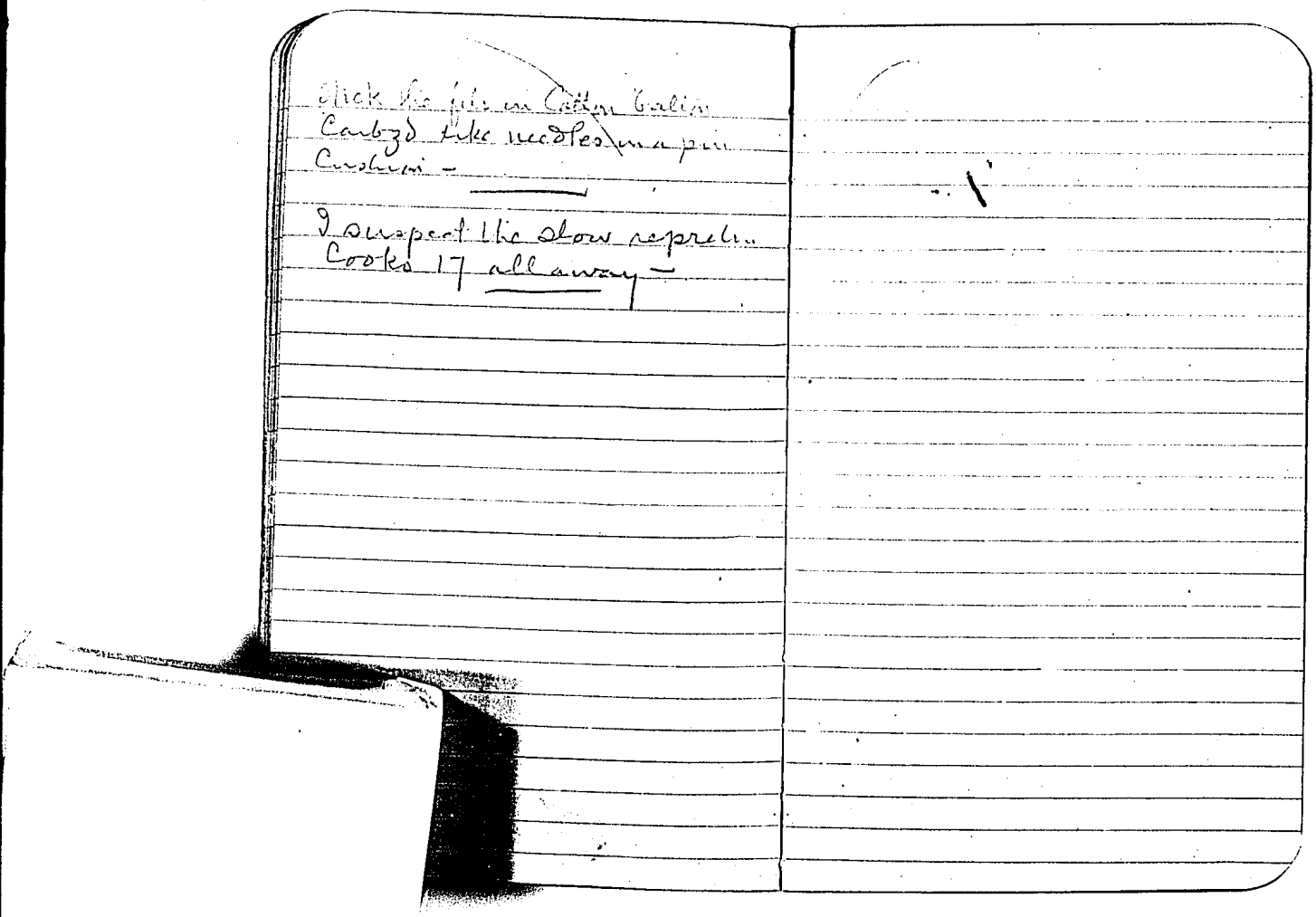
See if Carbon stick to objects when they are taken out moved.

Break off that ultra surface on mould see if that don't make diffn

Try new mould -

Axial comi amount current upon uses through fil to measure it -

possibly to compare make mould accuy at contact + (corr. oxi) yn +


Click the fish on Caitlyn Galin
Canby's like medPeshmen pin
Cushion –

I suspect the slow reprieve
Cooks 17 all away –

## TECHNICAL SCRAPBOOKS, 1881-1888

The technical scrapbooks are a set of seven books containing notes and drawings made by Edison between 1881 and 1888. Edison subsequently gave these materials to his attorneys and draftsmen to work into patent applications. They were eventually placed in these scrapbooks. Although the majority of items were pasted directly onto the scrapbook pages, numerous loose items were also inserted into the books. Many of the notes and drawings were witnessed by draftsmen Samuel D. Mott and Edward C. Rowland. The names of patent attorneys Zenas F. Wilber and Richard N. Dyer also occasionally appear on the documents as witnesses. Most of the notes and drawings concern electric lighting, but there are also entries relating to other topics, such as telephony, telegraphy, electric railways, and the manufacture of artificial pearls. A related scrapbook covering the period 1877-1880, can be found in Thomas A. Edison Papers Microfilm Edition, Part I, 6: 622.

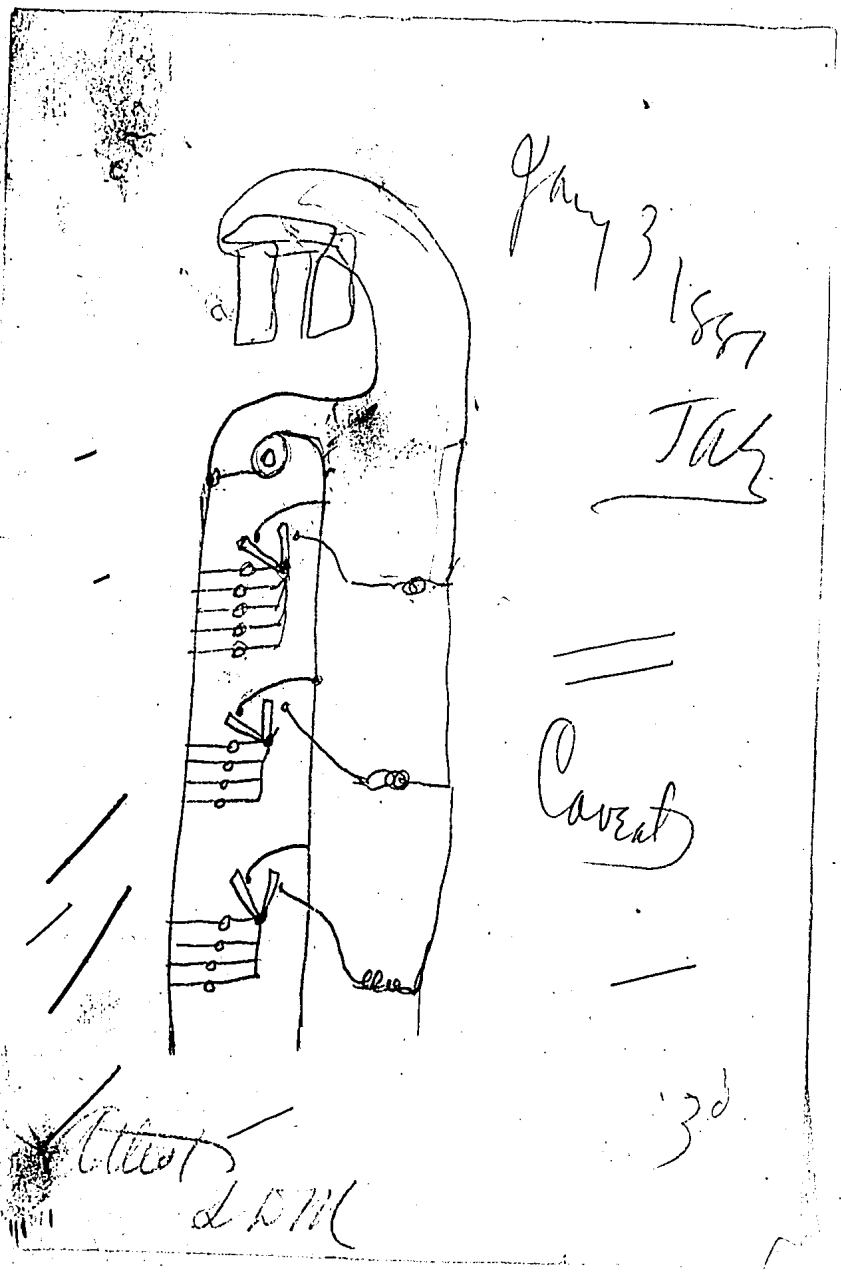
The scrapbooks were disbound prior to microfilming. They appear on the microfilm in the following order:

1. Cat. 1147 (1881)
2. Cat. 1148 (1882)
3. Cat. 1149 (1883)
4. Cat. 1150 (1884)
5. Cat. 1151 (1885-1886)
6. Cat. 1152 (1887)
7 Cat. 1153 (1888)

## Technical Scrapbook, Cat. 1147

This scrapbook covers the period January-December 1881. The entries are by Edison and relate primarily to electric lighting. Included are notes and drawings concerning lamps, generators, meters, regulators, electric power distribution, and other parts of the system. There is also some material pertaining to arc lights, electric railways, and ore milling. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney, and to Samuel D. Mott, his patent draftsman. Mott's name also appears as a witness on many of the documents. The case number of Edison's patent application has been written on some of the items.

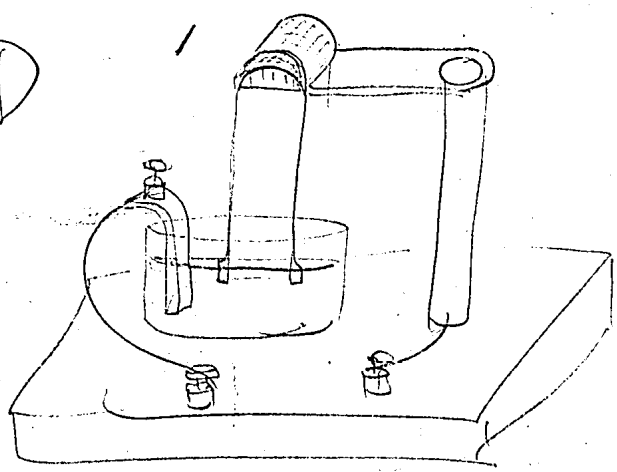
January. 1881



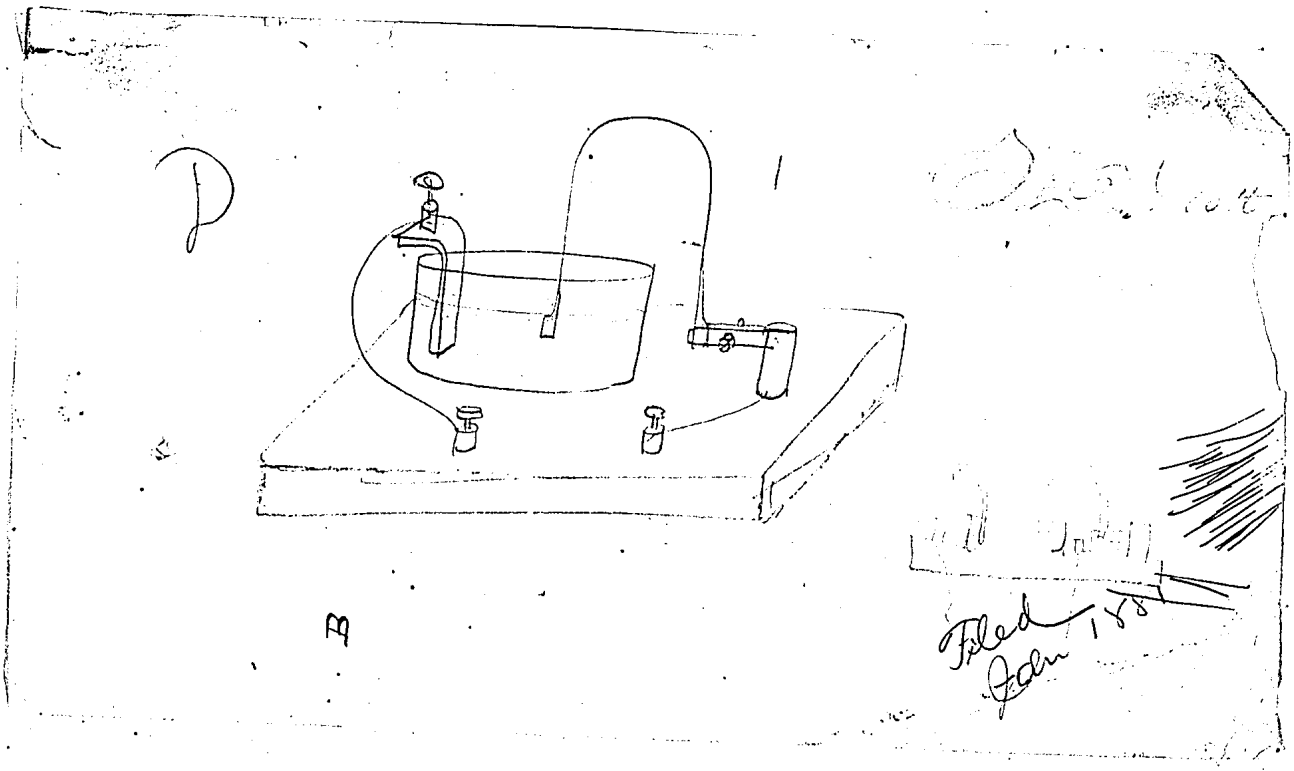
Jany 3 1881

Caveat

3d



Filed Jan 11, 81.


P
B
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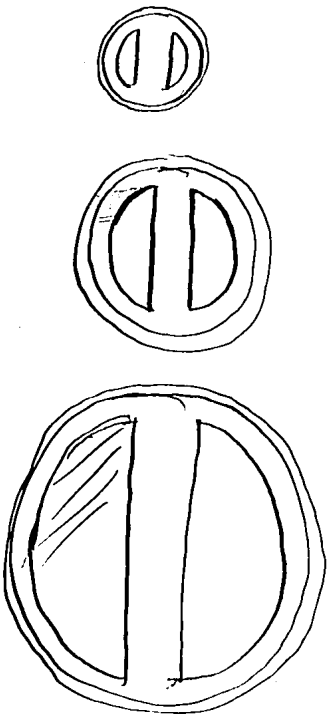
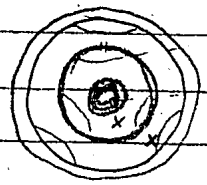
Jan 18

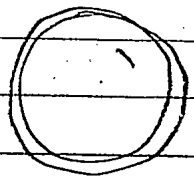
Feby 5 1881
Tas

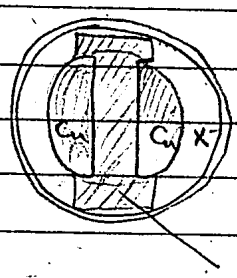


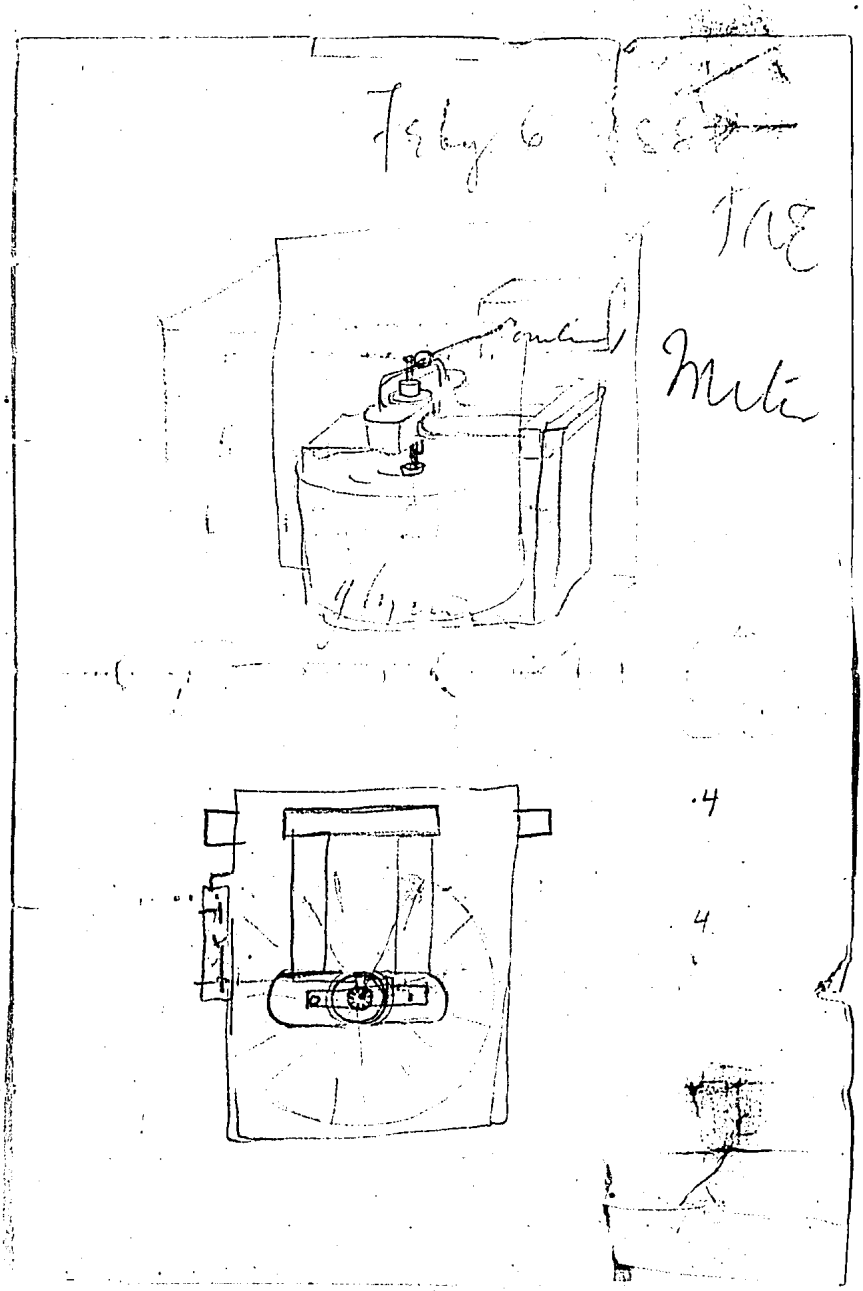
— February 1881, —

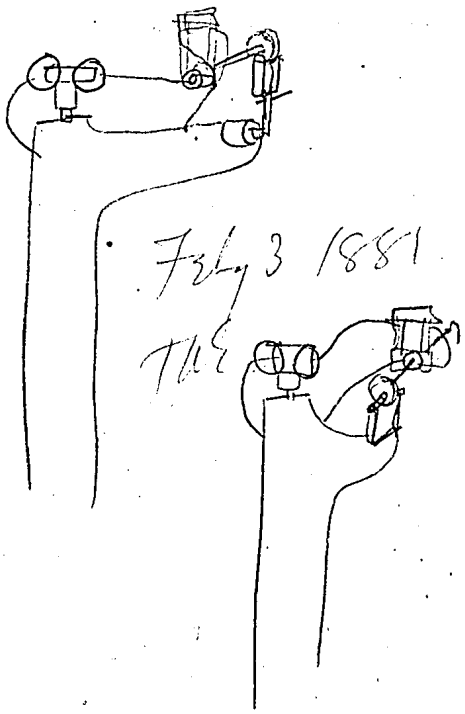
Feby 7 1881








Feb 3 1881

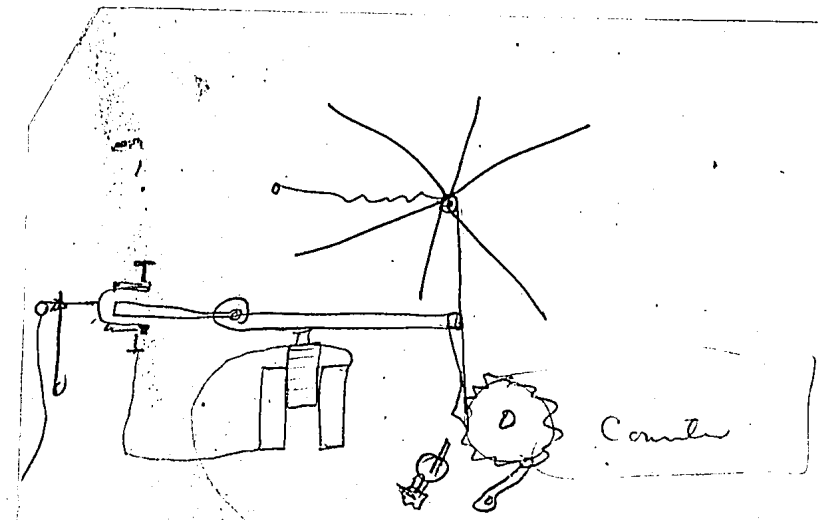
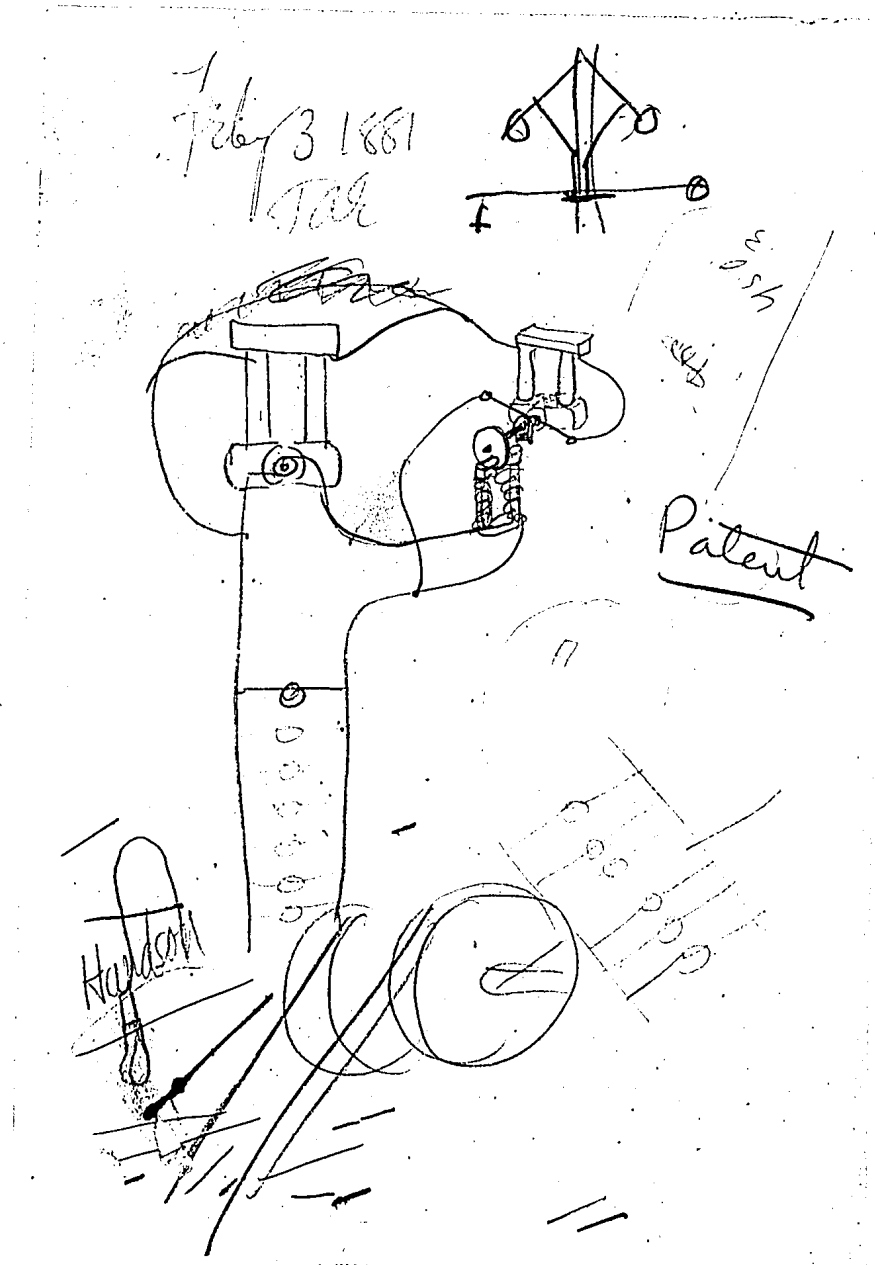
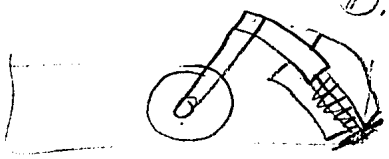


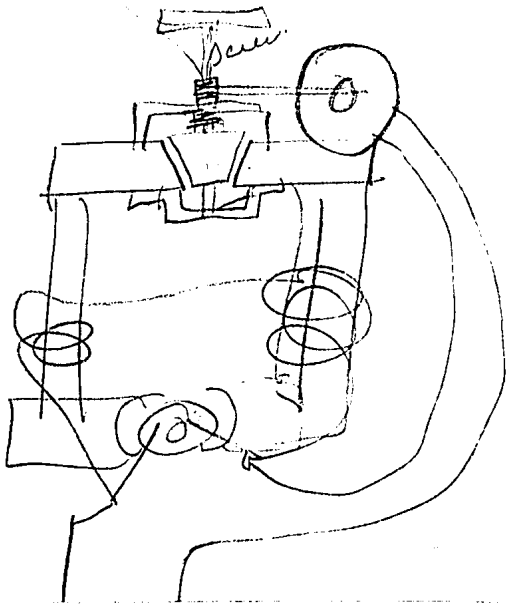

Fig 1 1881年式


Feb 3 1881
Patent
Hudson

March 9. 1881

D. F. Hall





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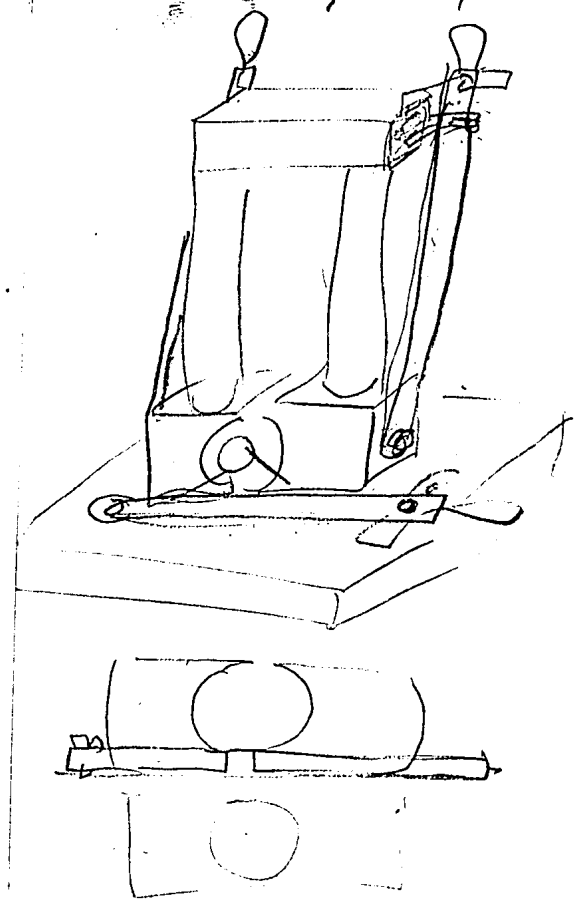
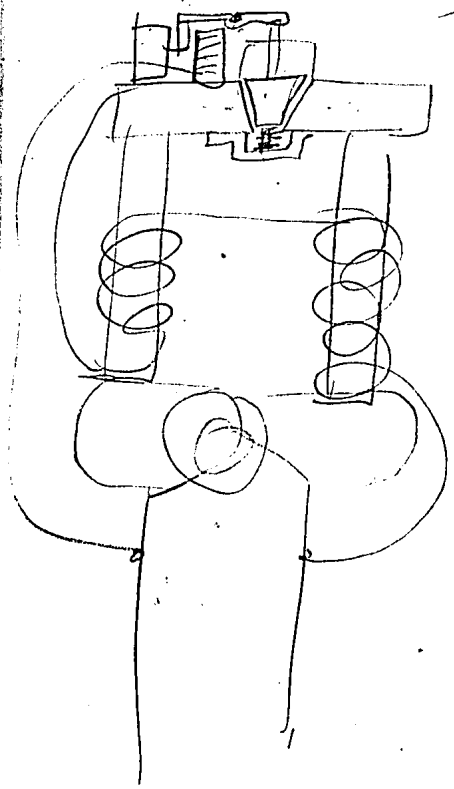


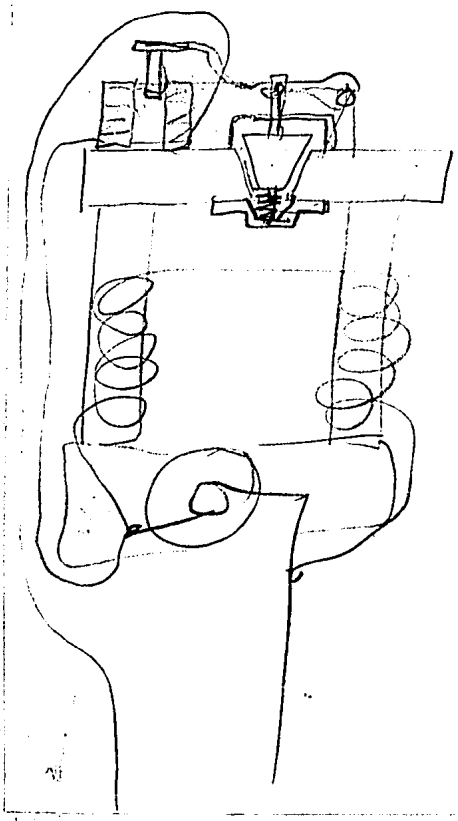
March 9. 1881

D. Stillwell

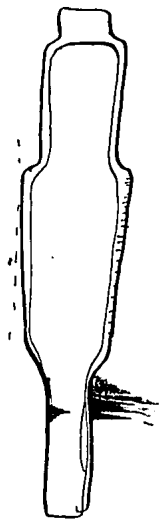


March 9, 1881

S. D. Mott



March 10 1881



The Edison Electric Light Company,

65 Fifth Avenue,

Norvin Green, Pres.
S. B. Eaton, Vice-Pres.
E. P. Fabbri, Treas.
C. Goddard, Sec'y.

New York,.....188

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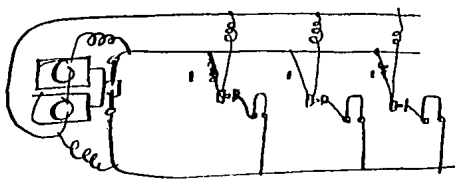
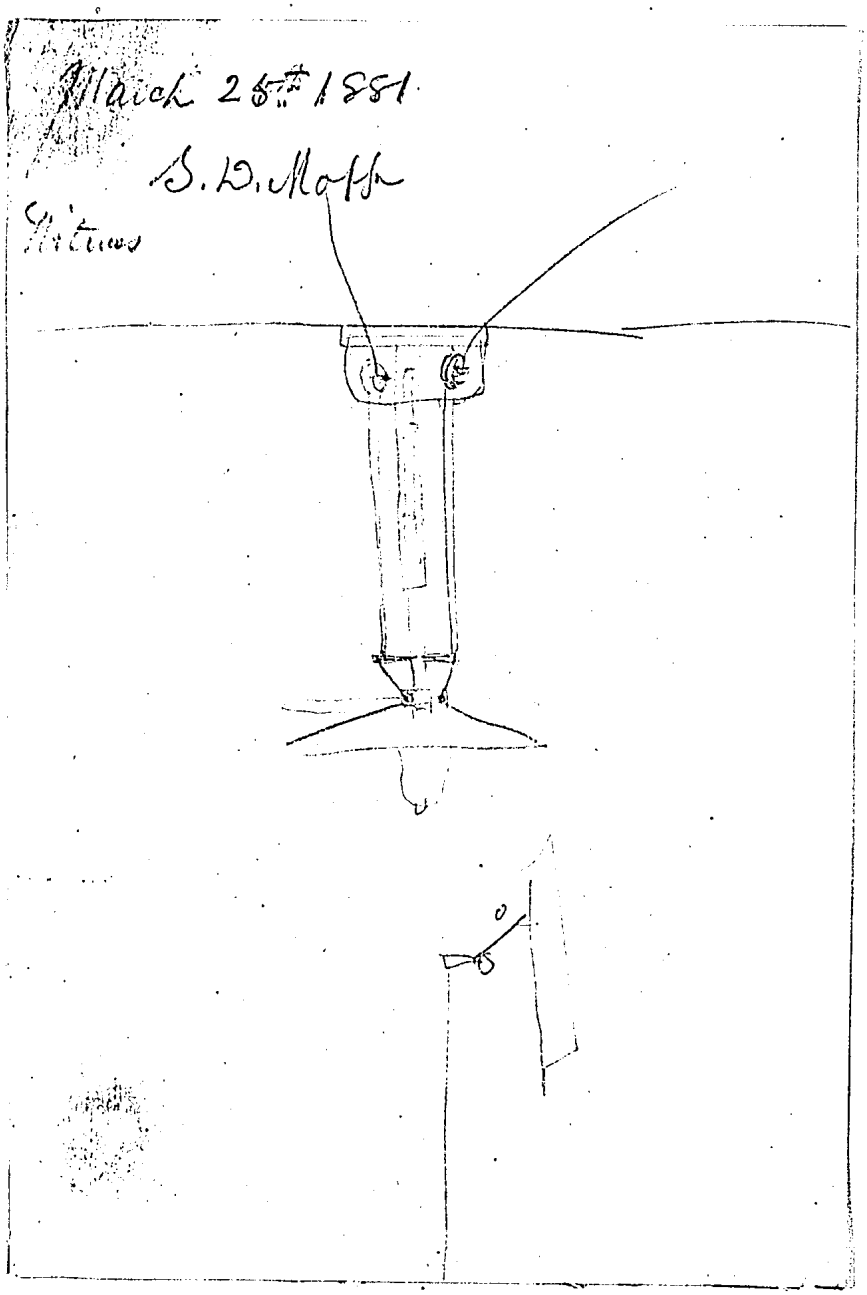


March 1881

March 25th 1881

S. D. Mapes

Witness



Case 302

Figure 1

a b c

Figure 3

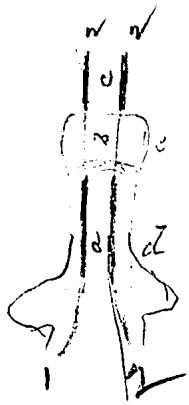


Figure 4

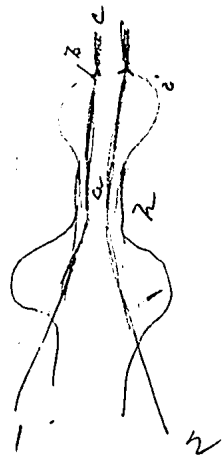


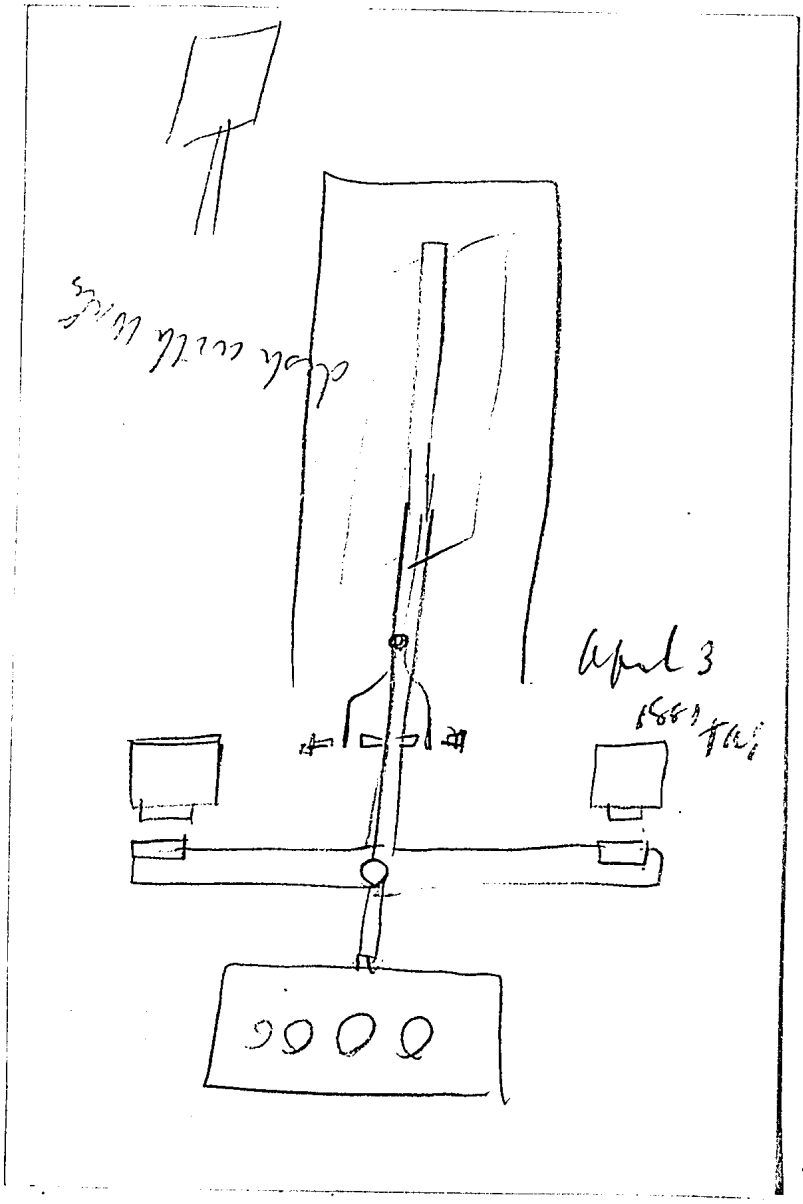
Figure 2

a b c

Citing

S. D. Mc H

— april — 1881 —



The Edison Electric Light Company,

65 Fifth Avenue,

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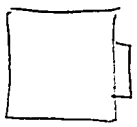

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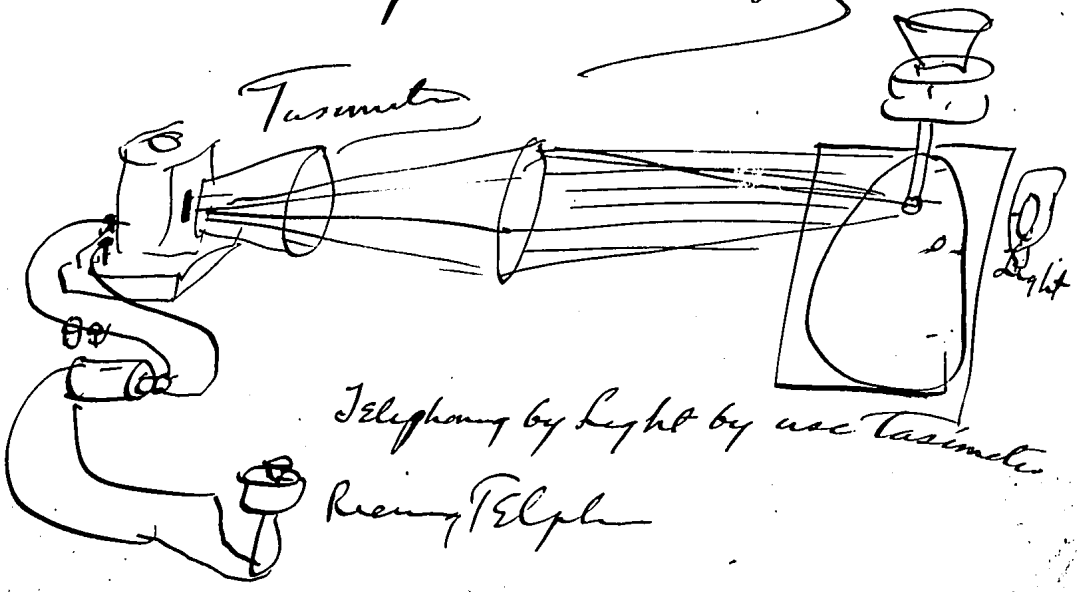
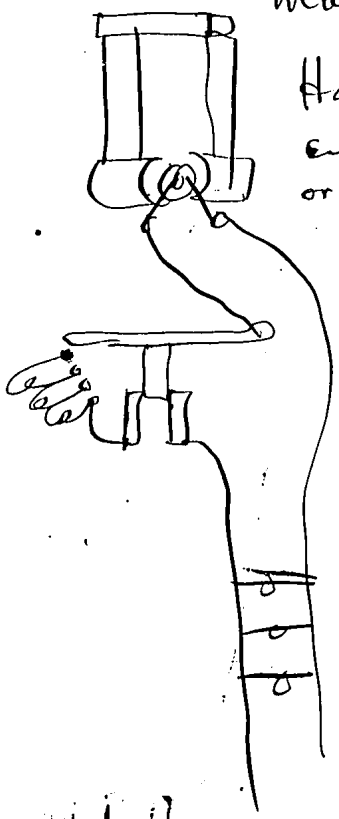



Telephony by Light by use Tasimeter

Receiving Telephone



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Have I their
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April 4th 1881

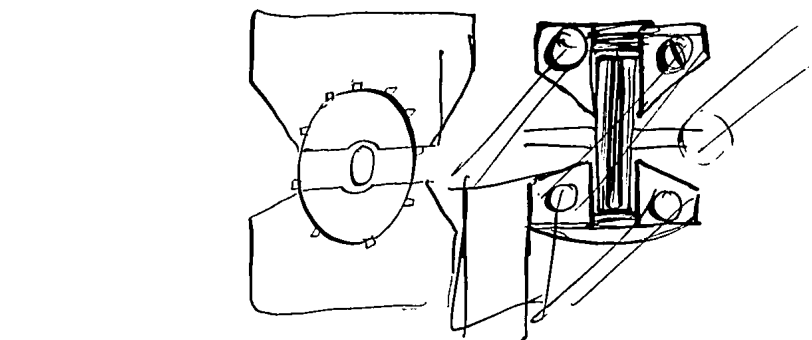
S. D. Mott

The Edison Electric Light Company,

65 Fifth Avenue,



New York,.....188



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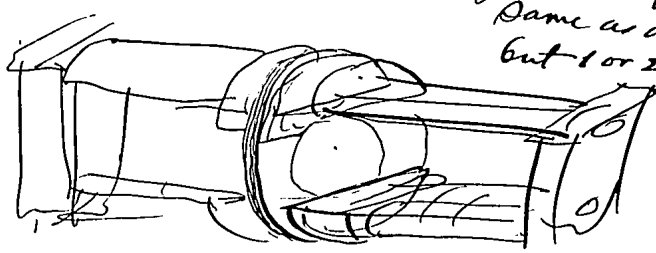

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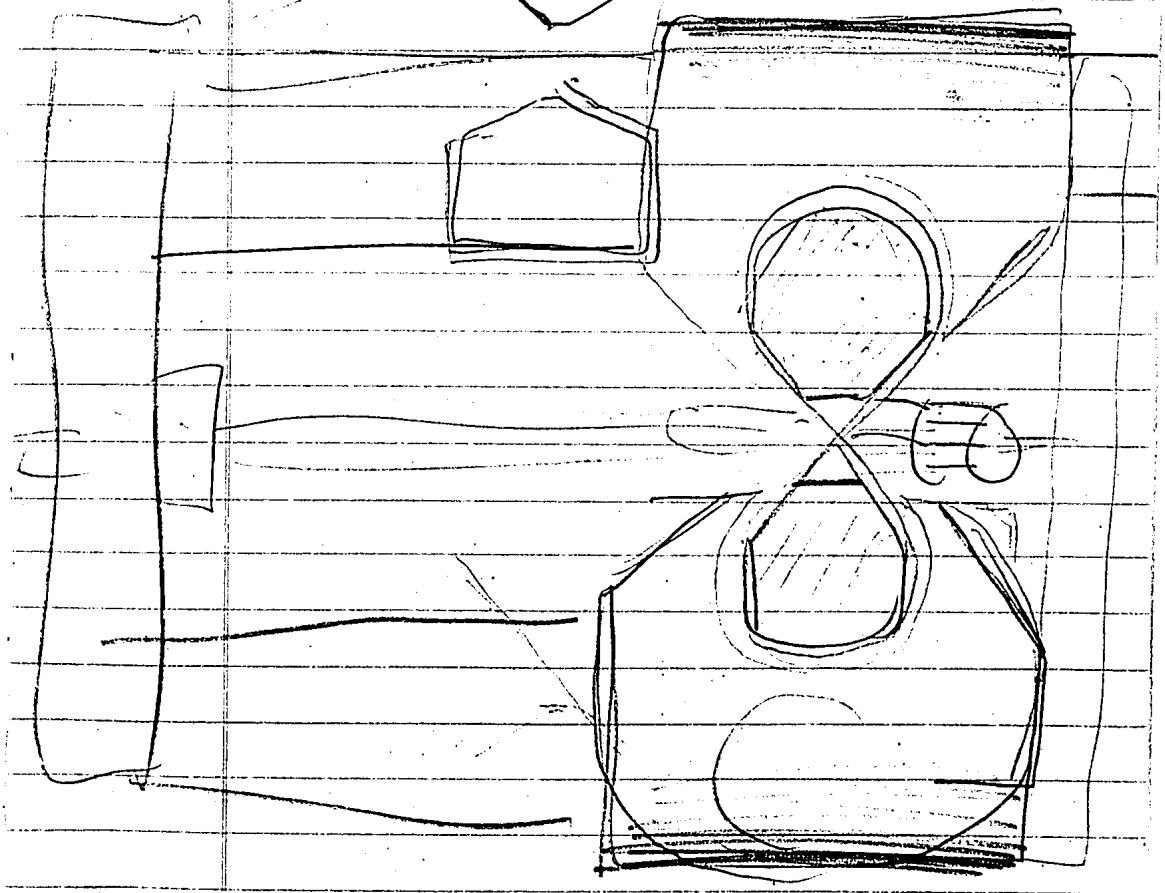
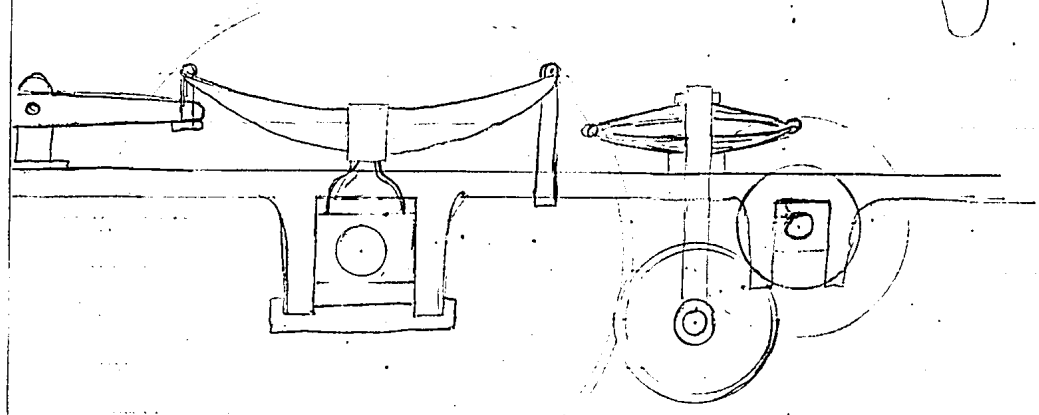
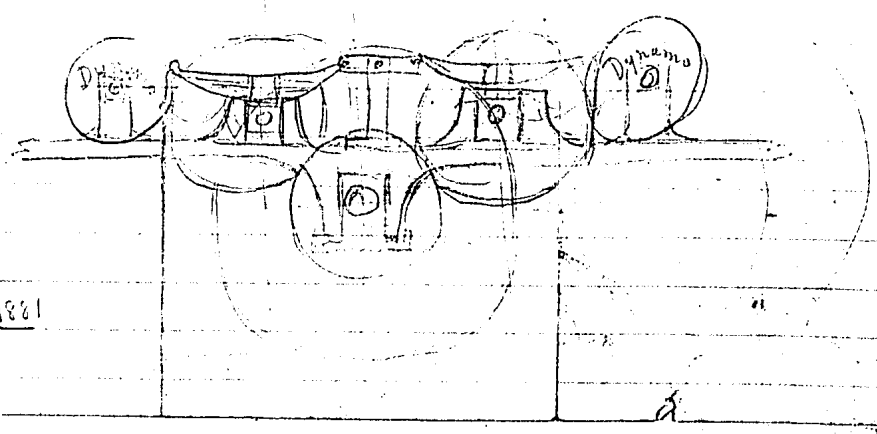


New York, _____ 187_



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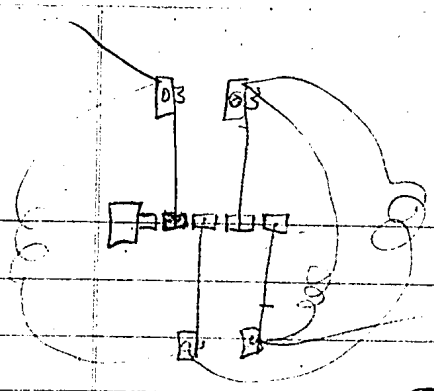

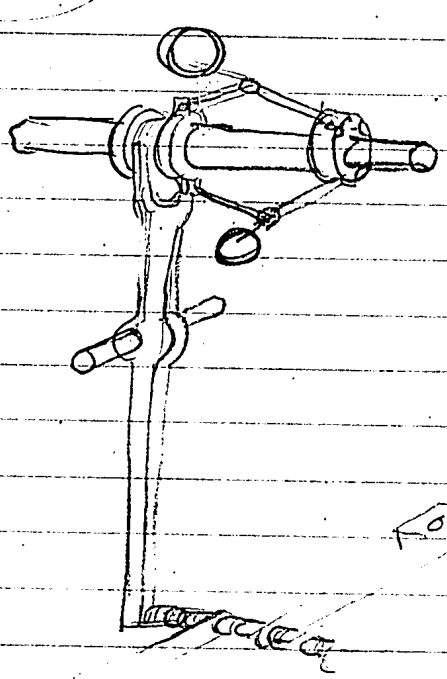

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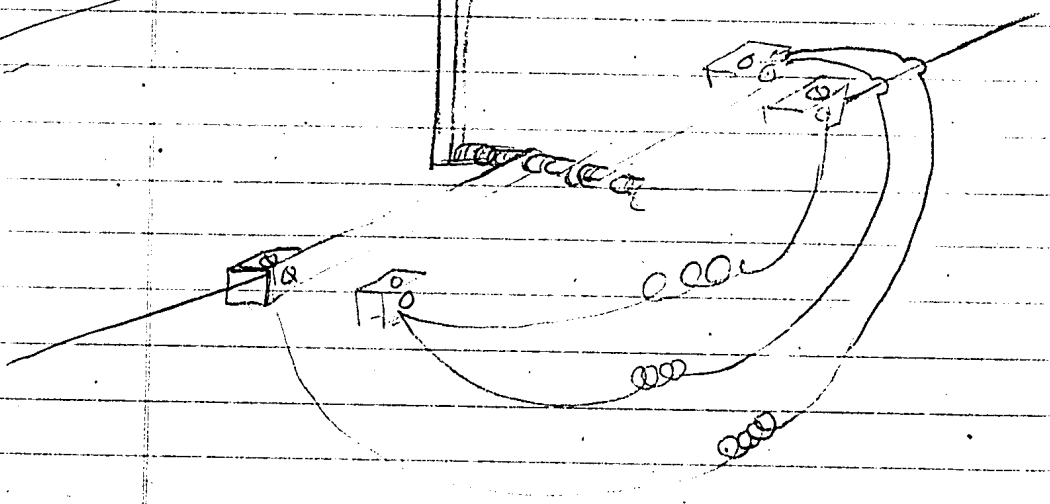

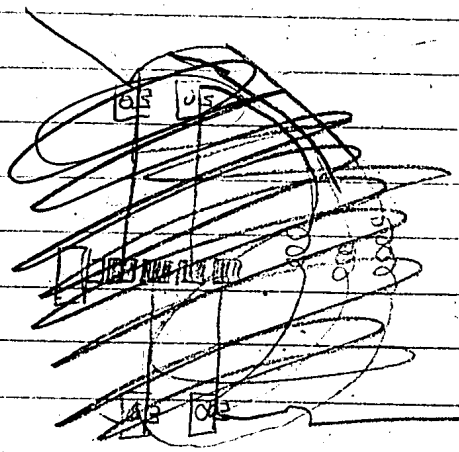

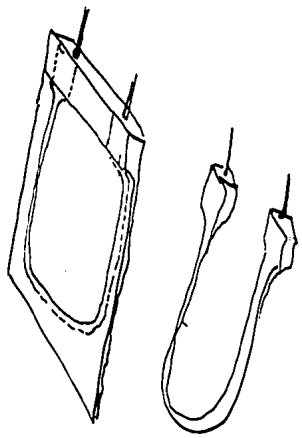

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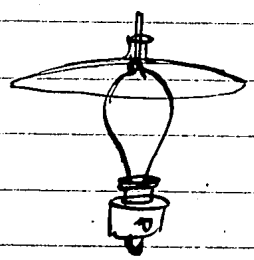
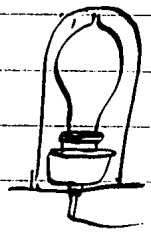
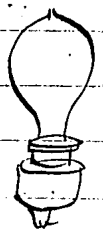
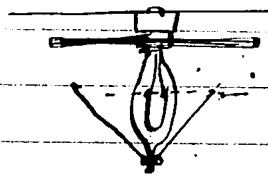
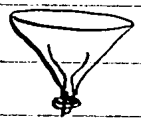


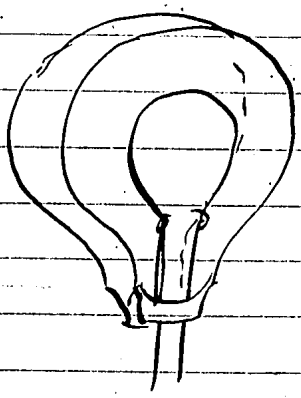




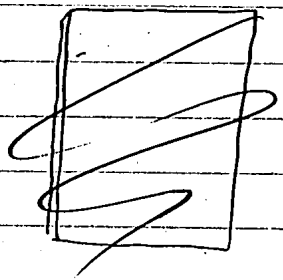
frosted globe - April 19 1881 TAE







flat glass blown in mould



April 20 1881

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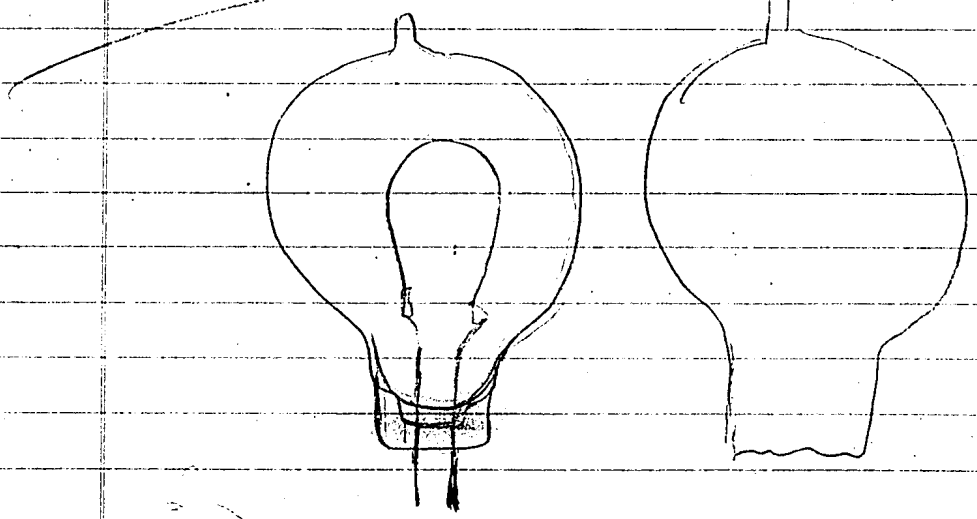
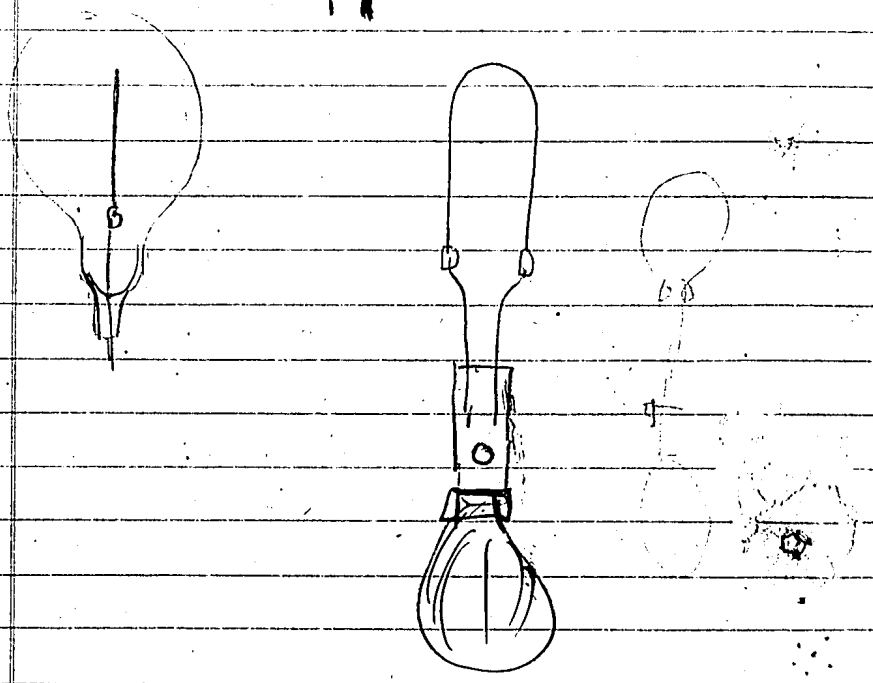
S. D. Mott

Patent





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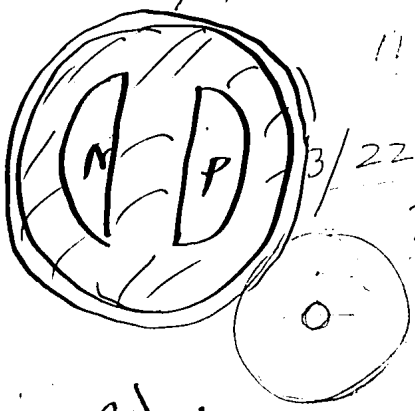


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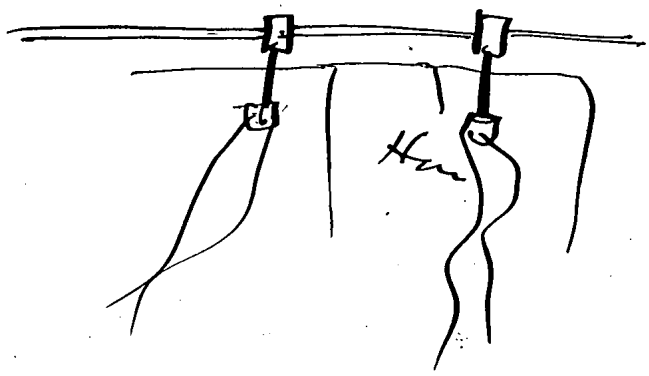

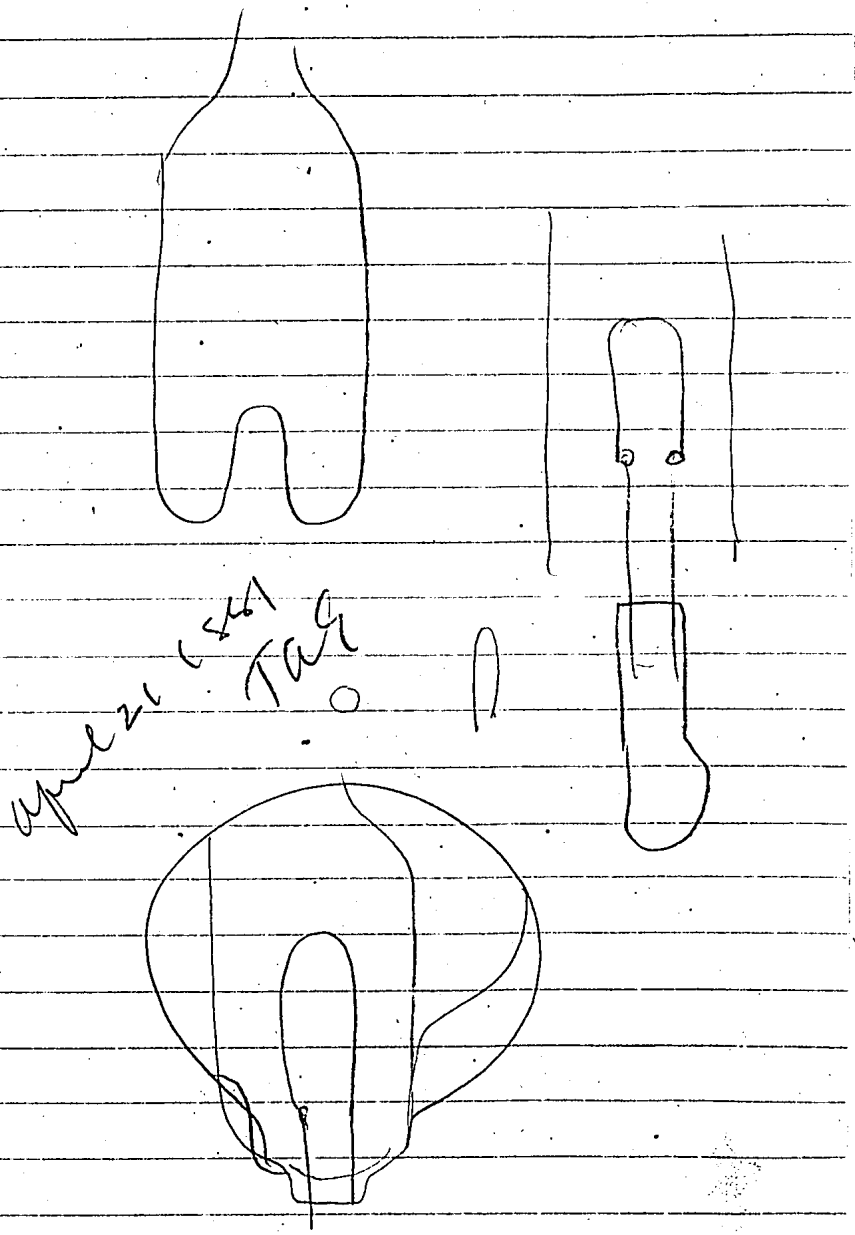

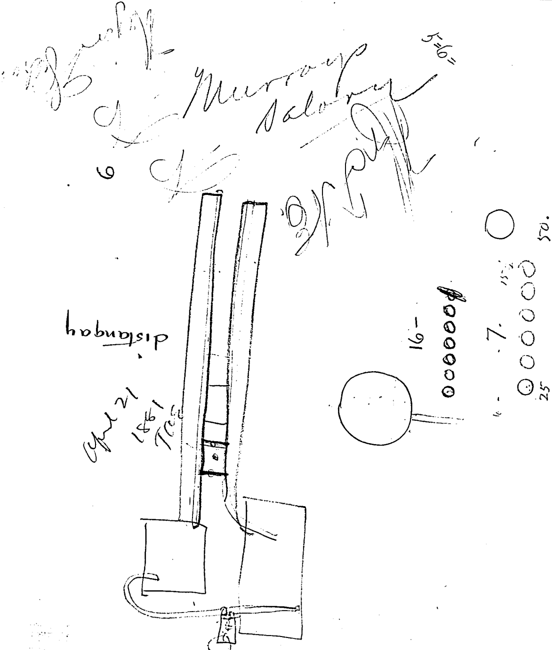
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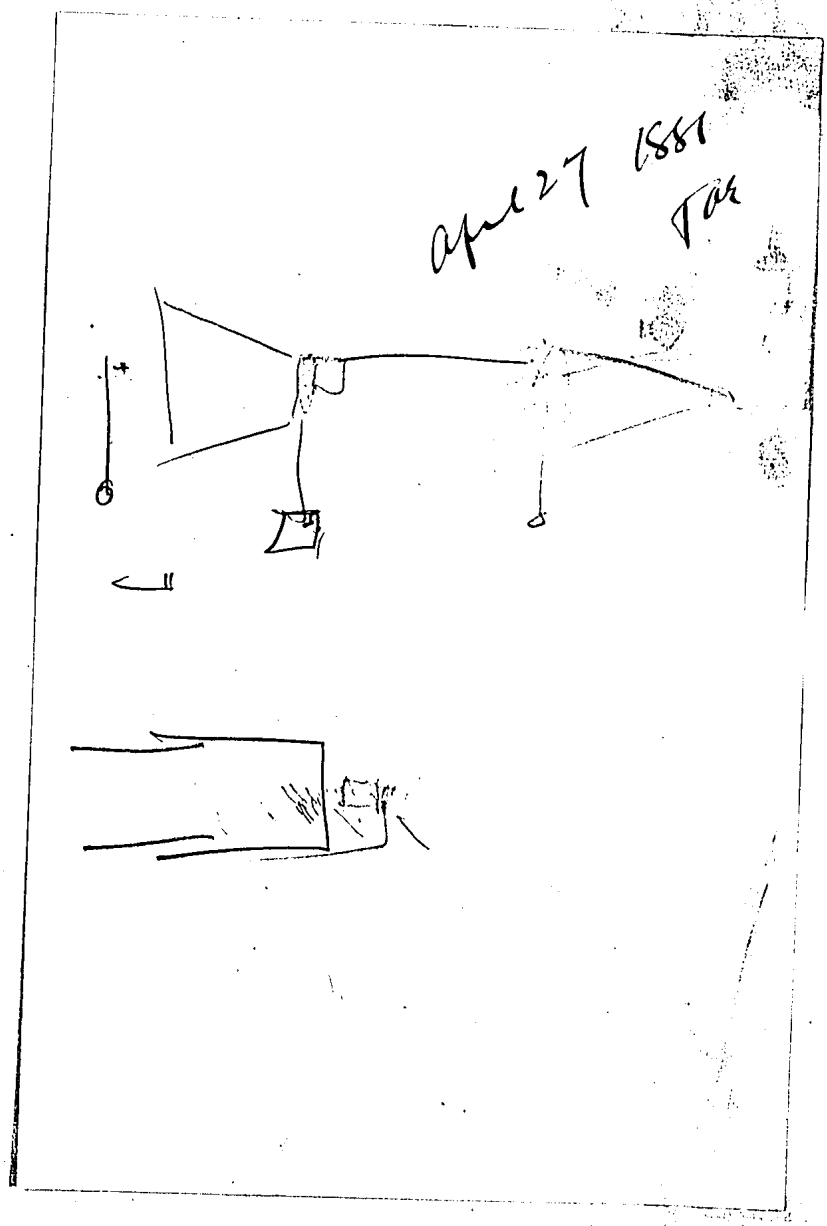
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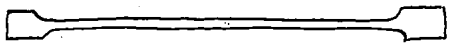

fig 1

fig 2

The filament is
broader than it is
thick

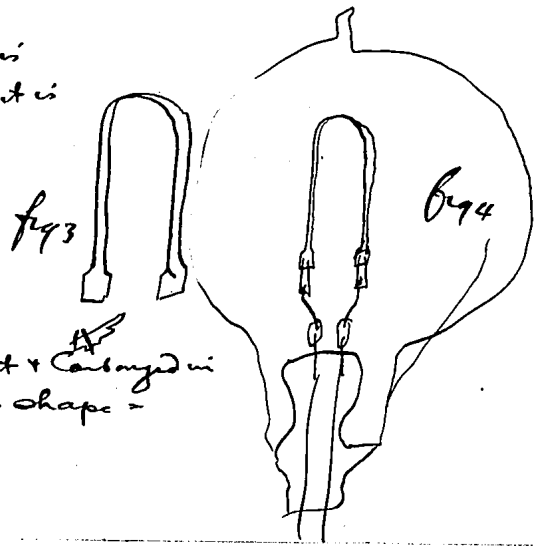

fig 3

fig 4

Bent & Carbonized in
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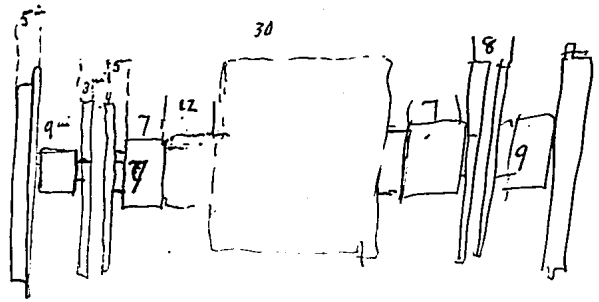
Electoco
April 27 1881 Tag

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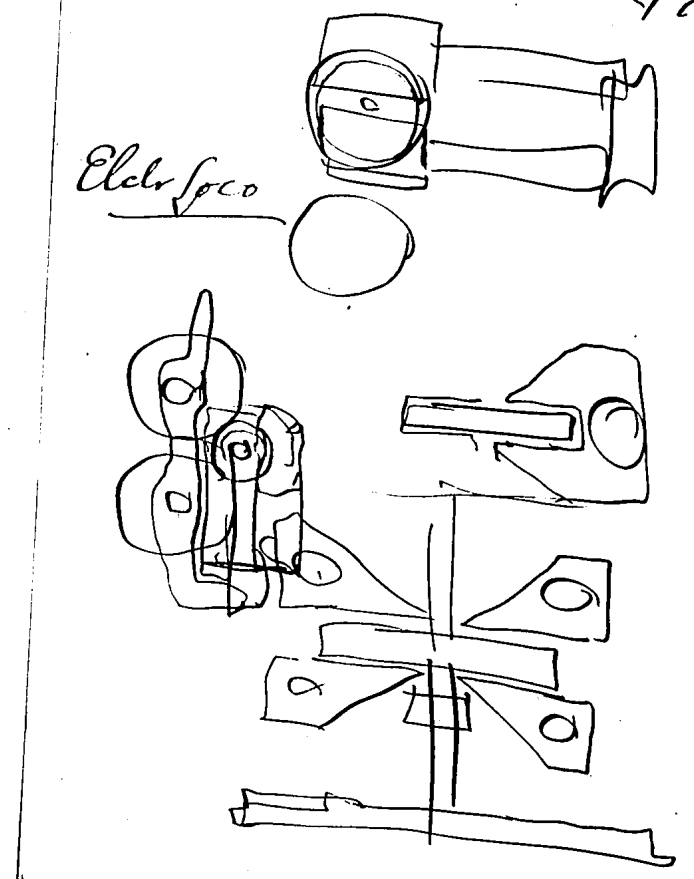

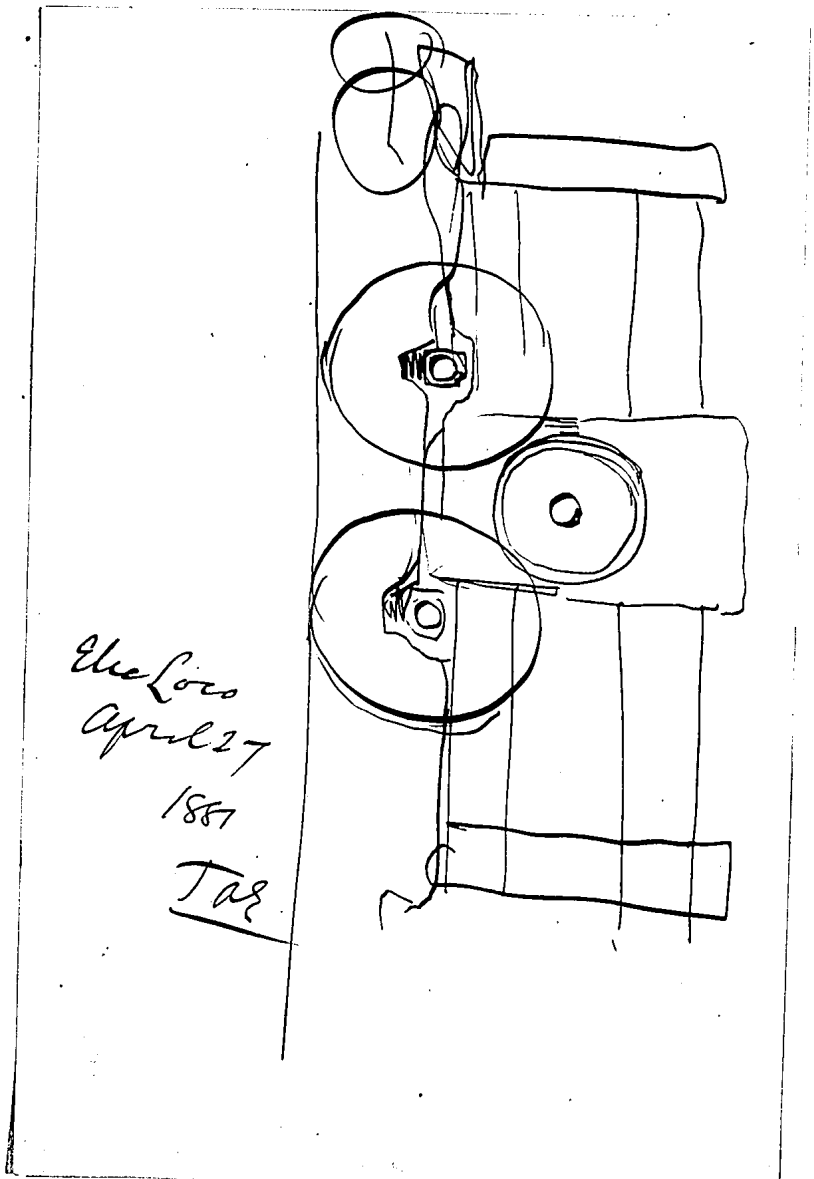

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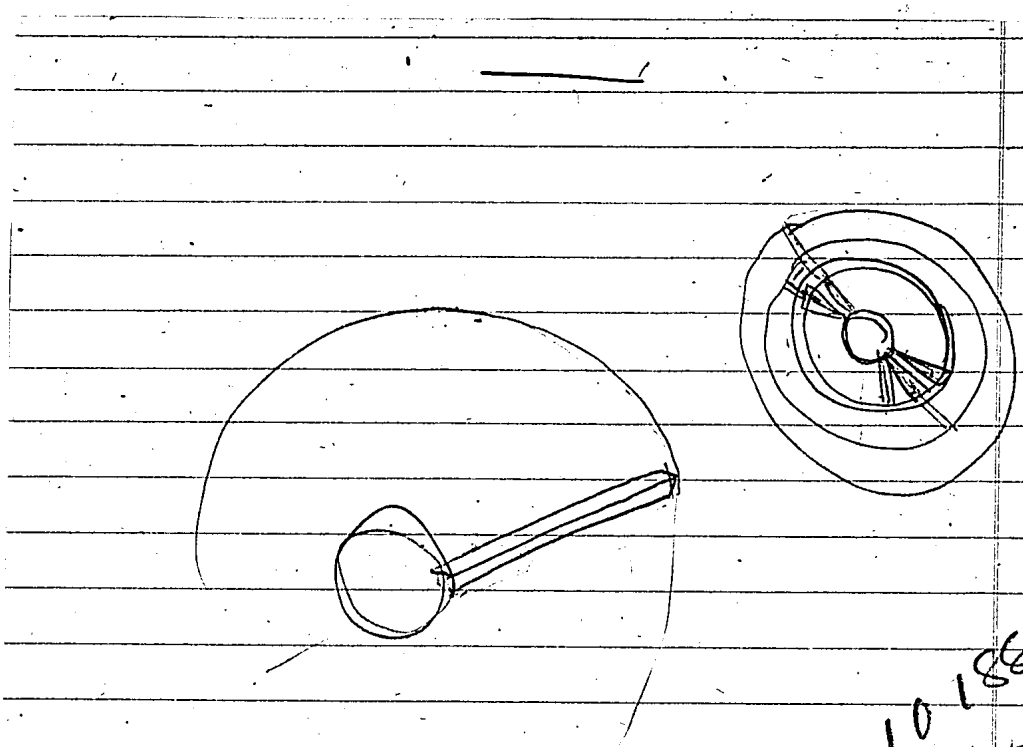
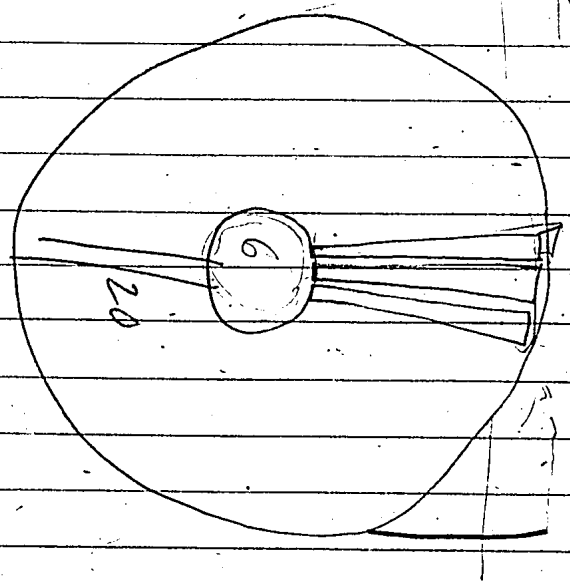


May 10, 1861

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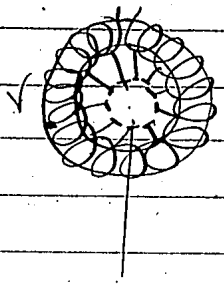

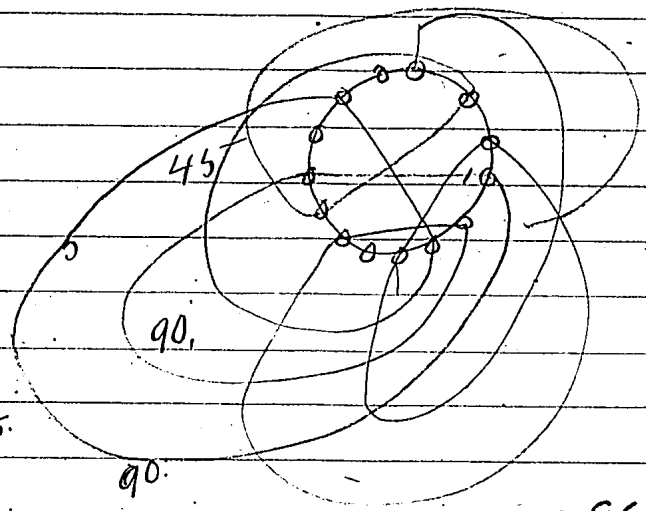


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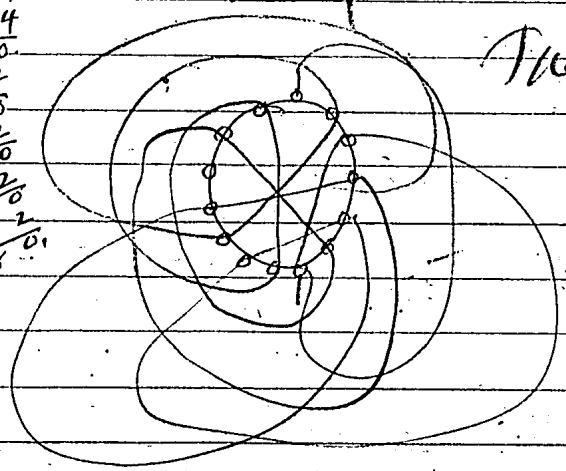

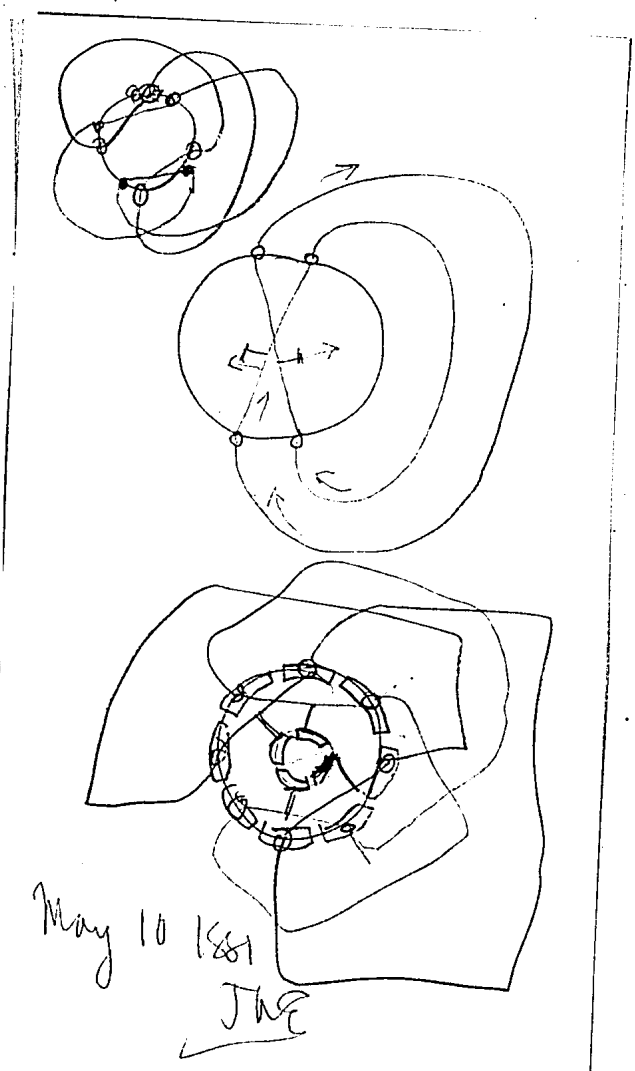

May 10 1981

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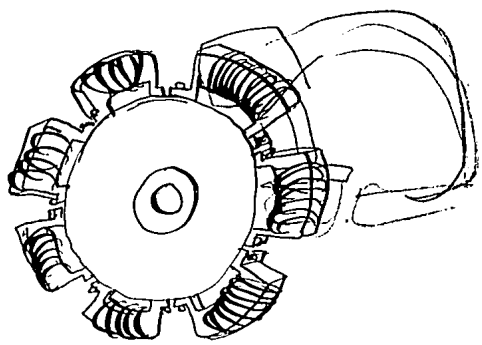


May 10 1881
Tak

Ground Glass Lamp Shade

from Holzer May 16 1881

T.A.E.

Put burning at 6 P.M. 18th

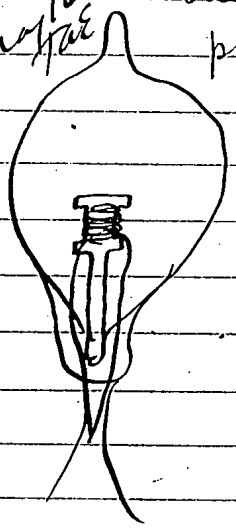
May 1881 T.A.E.

Upton to have following made —

Order given to Upton Sept 16 1881

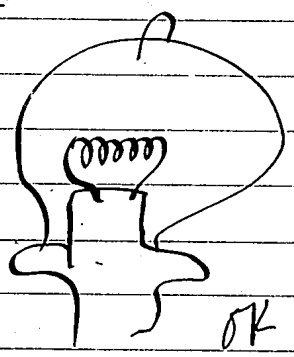
Ask Upton if he has started

Moulding brass plumbago plates for Carbonizing —



Sample as in Case 176 ~ patent 227.229.

get 3 or 4 —

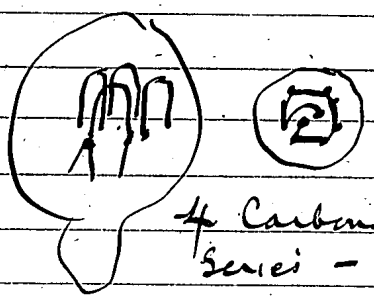


Spiral Bamboo

also some with thread & dumbbell & [illegible] rolled on —

also 2 with single thread = not put in spiral form —

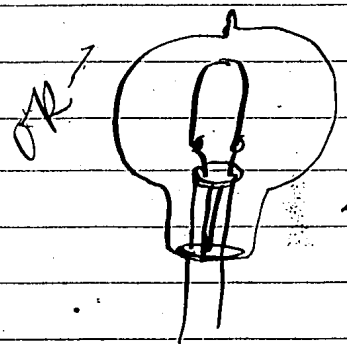
Make (2) Lamps



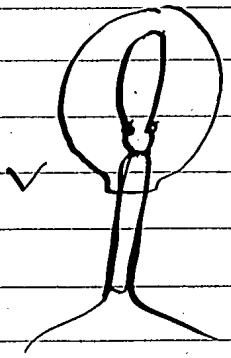
4 Carbons B size in Series —

also Lamp 4 B Carbons in Multiple arc

OK

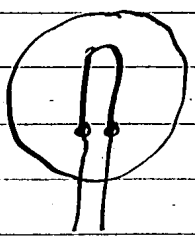


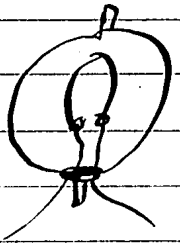
2 of these =

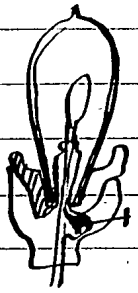


1 of these

4 Each =

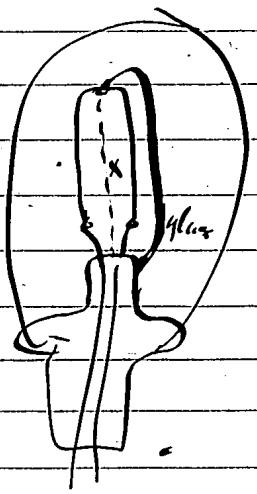




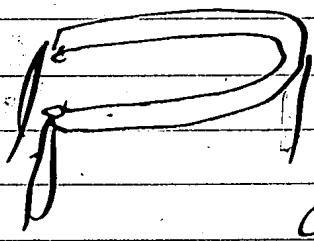


Impt

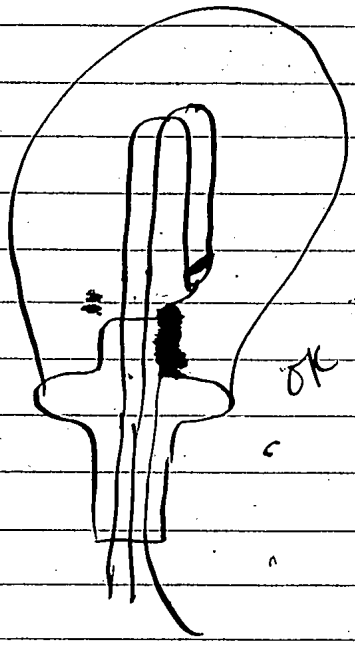
1 of these




1 of these.
1 like X -



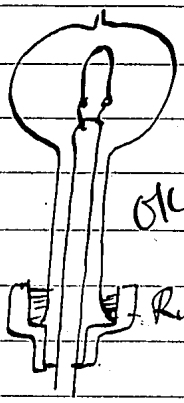
Vacuum Expts
on Carbon loops
Coating +
Carbonizing
get the plot onto disc.



Right angles. Can be used in series.

OK

C

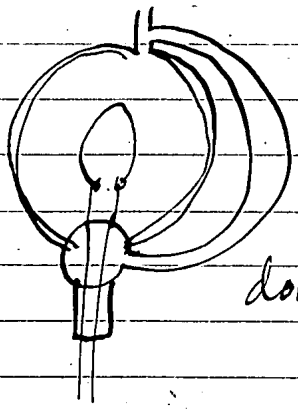


OK

2 of this

OK

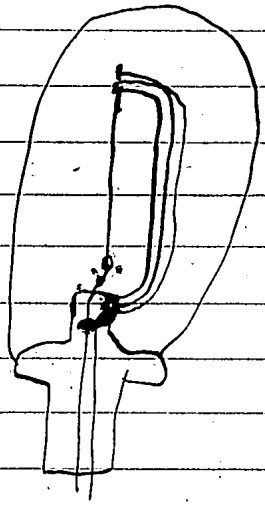
Rubber



OK

1 of this

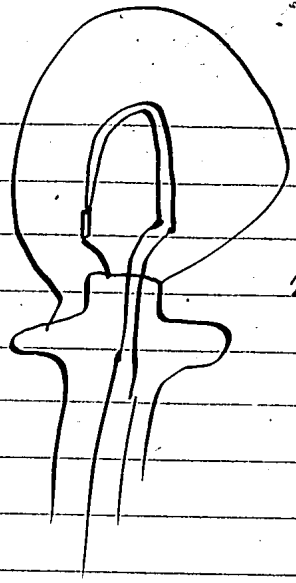
double seal



OK

OK

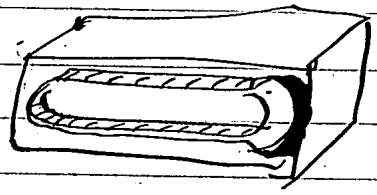
2 of these

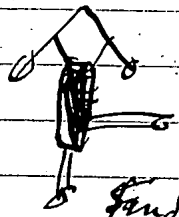


2 of these,

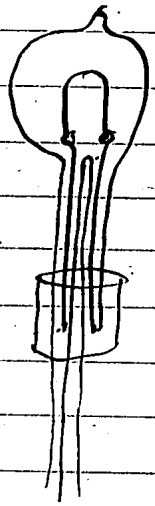
Get some Carbons with Lignum Vitæ Ends or also Nickel Mould where this kind of carbon was bent + Carbonized,

get lot of the wood Carbons + Blanks



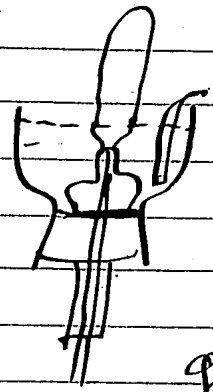


Sand blast



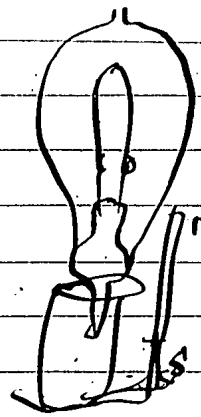
Large Lamp
Column Hg Seal

Save all those moulds where we Carbonized fibres of diff shapes. Etc

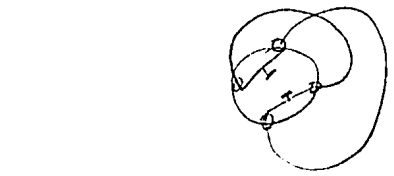


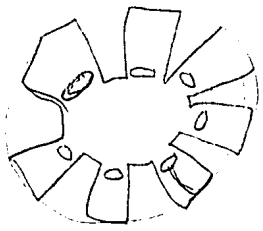
one of these

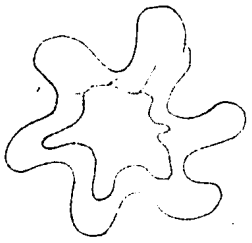
Get some of the lamps with one side of the carbon thicker than the other also some of the carbons this is important -



or one of these

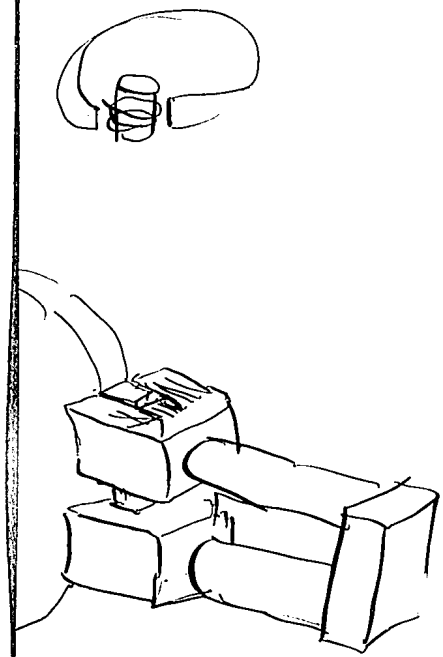




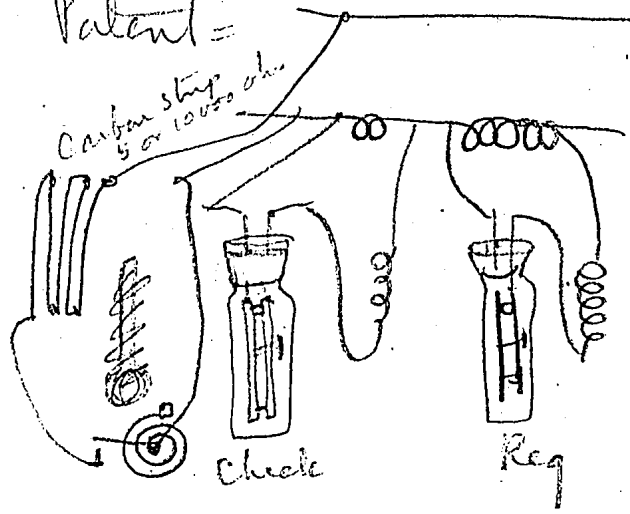


May 10 1981

TAR

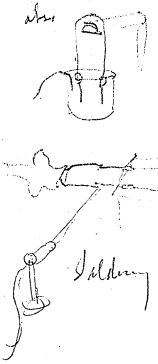


Patent = May 13 1881 Edr




Carbon to bend
spring outward or other
Thermostat to close
carbon circuit when
thermostat falls too
low by closing circuit

also medium to show cell of Co to




Patent
Moulded socket for
Lamp -

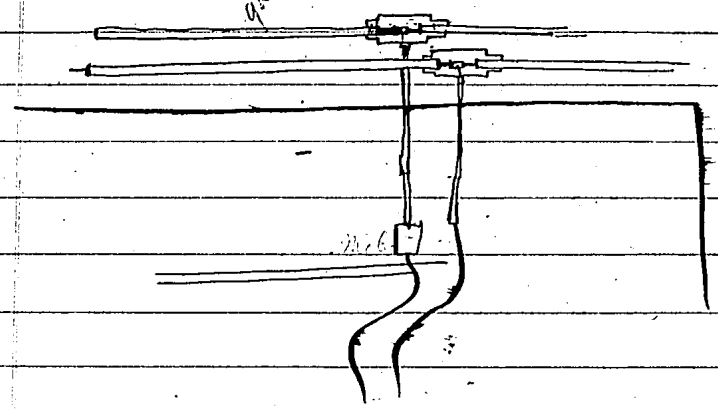
also show new
Cross box
Screw box
Feeder box

also device for
main line

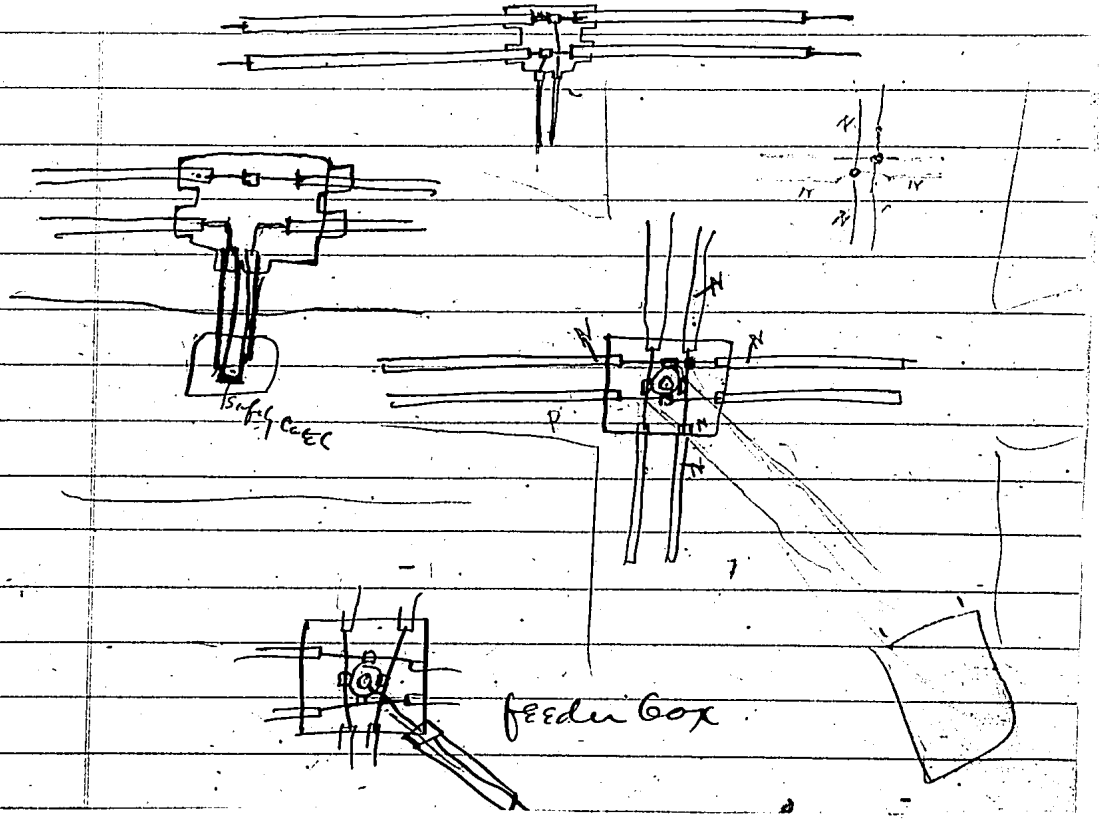
May 16 1881

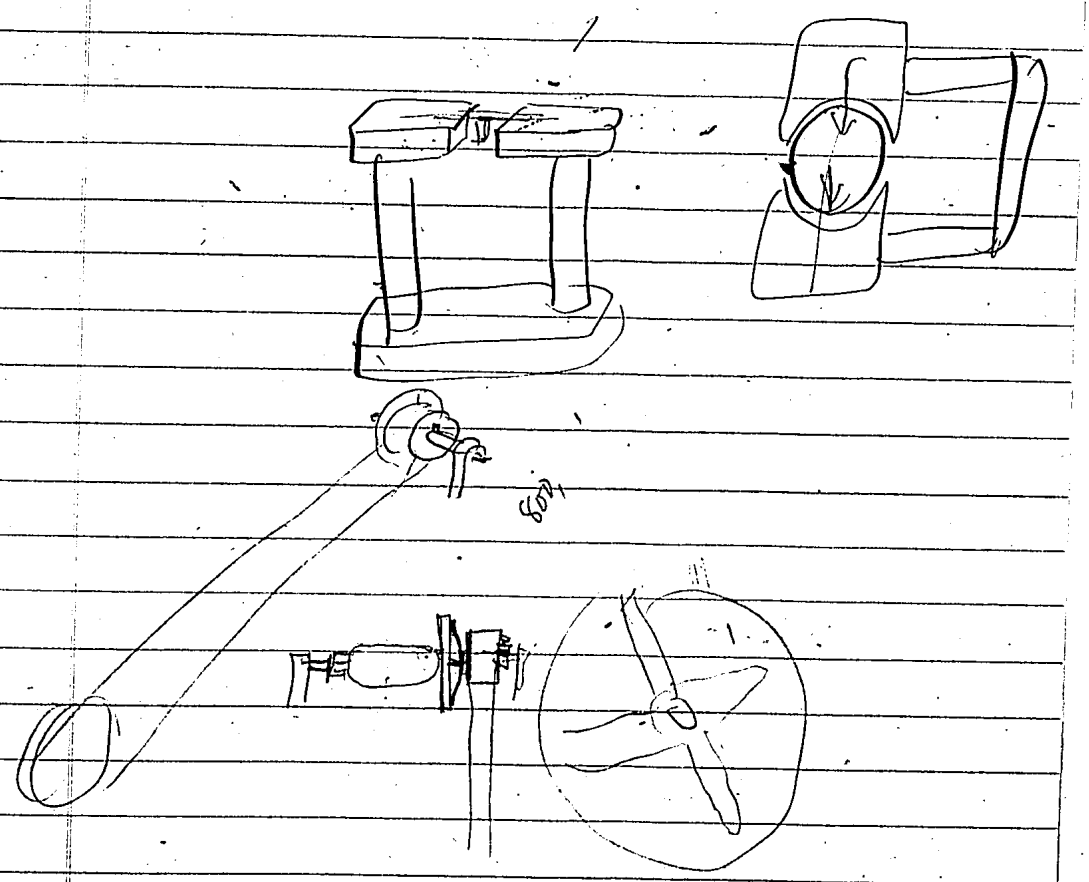
Jas

S. E. Mott



Patent

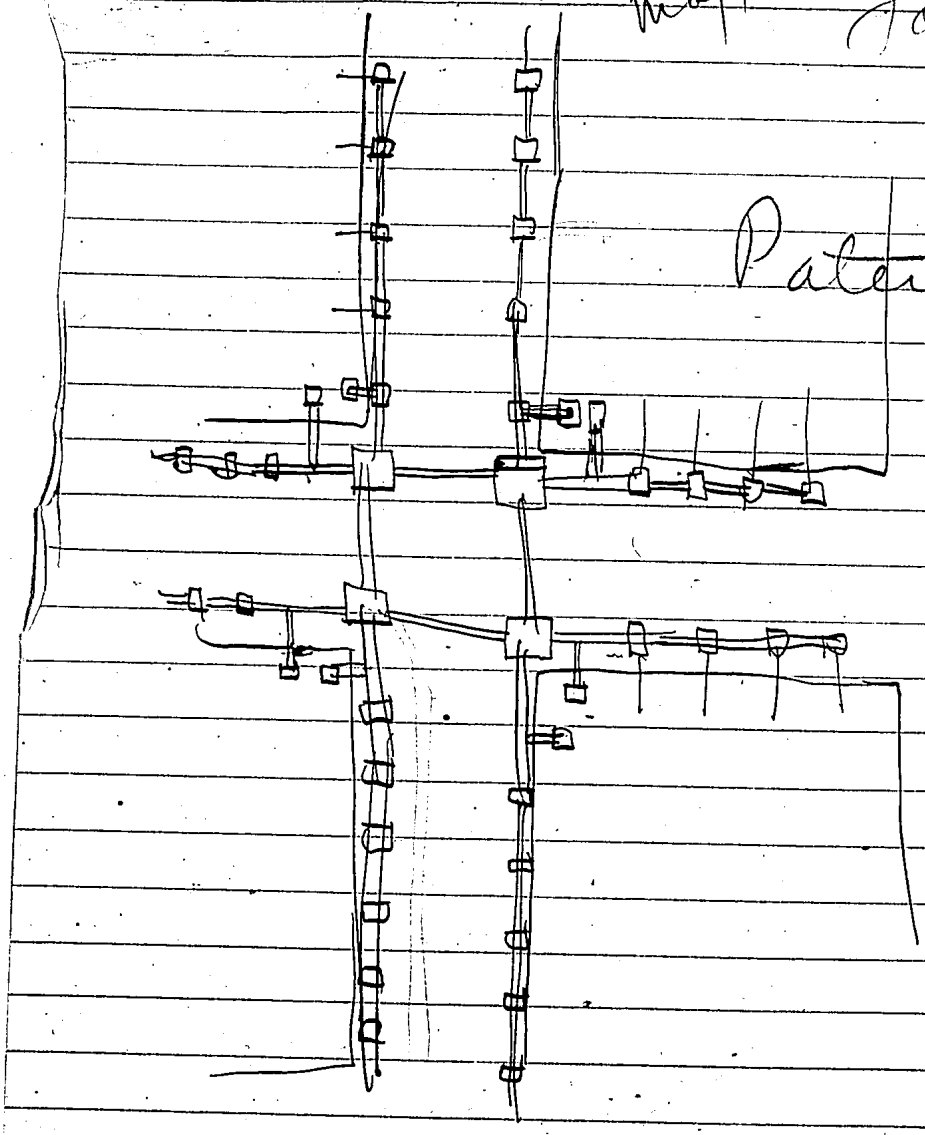




May 16 1881

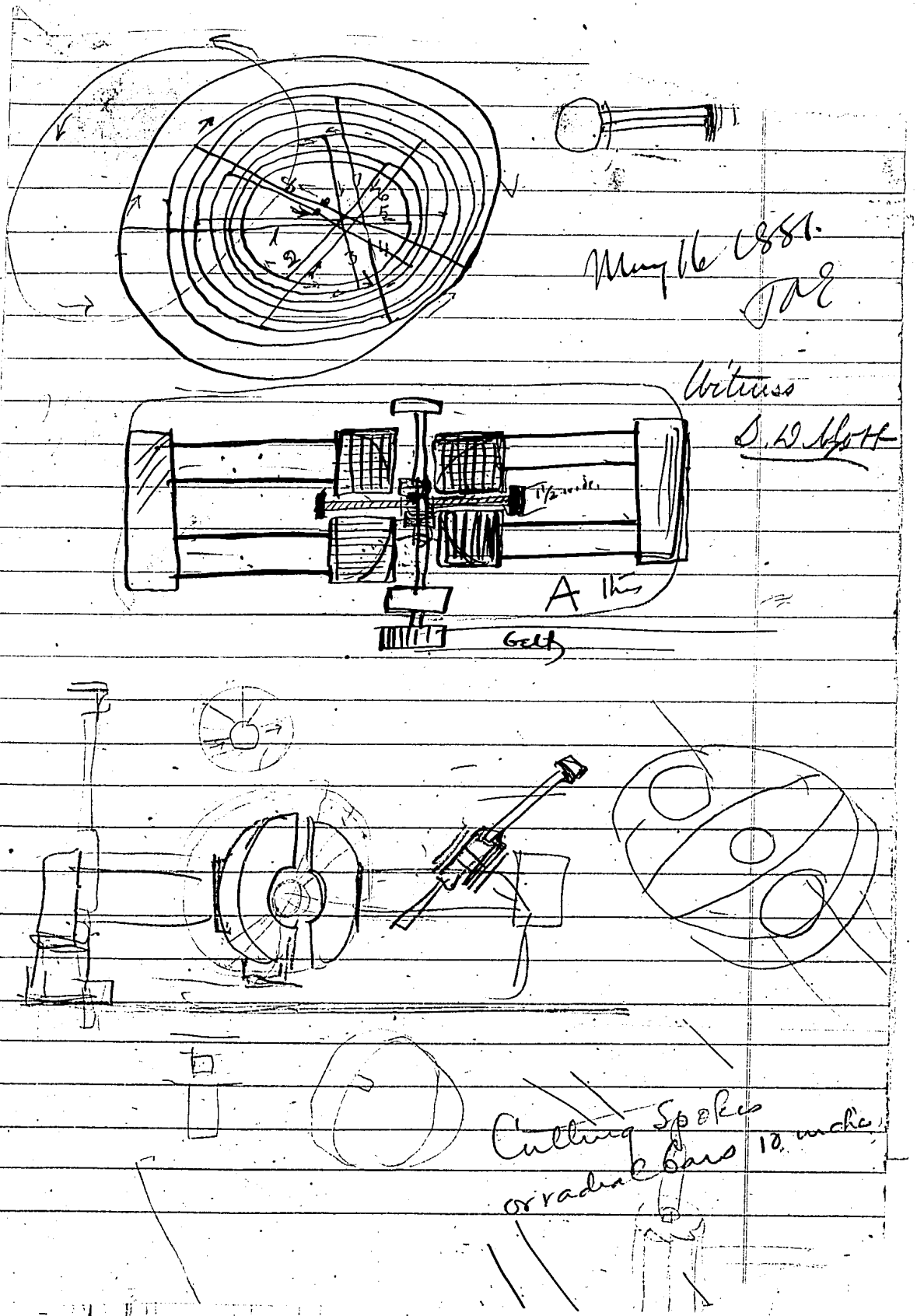
May 16 1881

Patent



Witness

D. D. Hoff


May 16 1881.
Witness
A
Cutting Spokes
or radius bars
10. inches

318

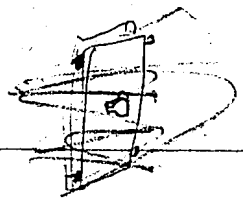
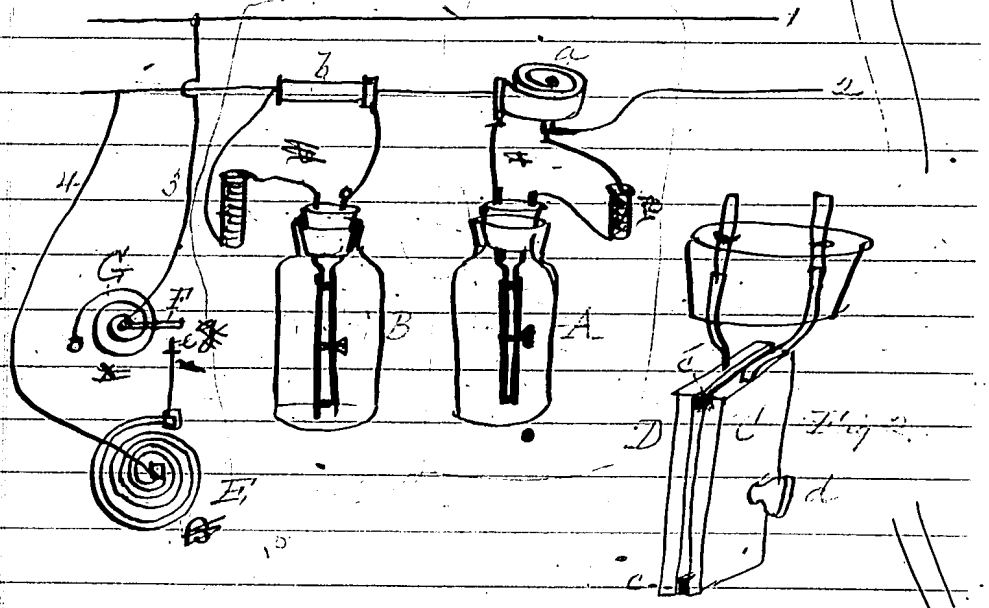


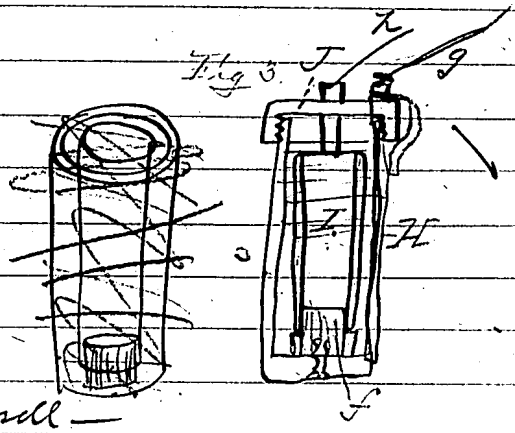
Fig 1.




X is spring which when meter gets cold contracts & lever g closes on n throwing the Carbon Resistance Coil B in circuit & heat is generated sufficient to keep temperature up & meter from freezing. The whole meter being in clock box

Fig 2.

Fig 3.



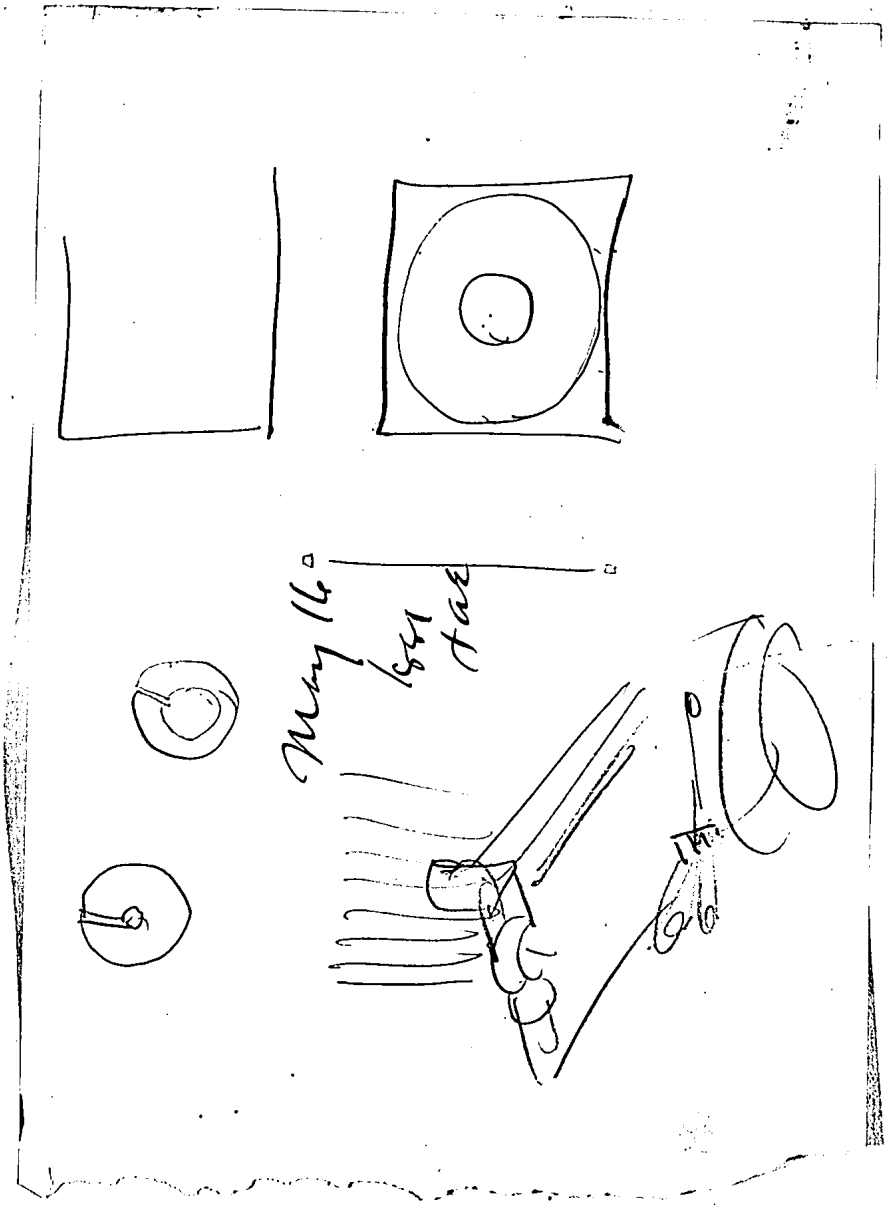

May 16 1881.

Arturus

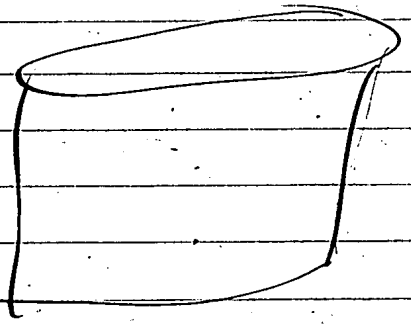
S. D. Mott

Copper Vessel

— May 1881 —

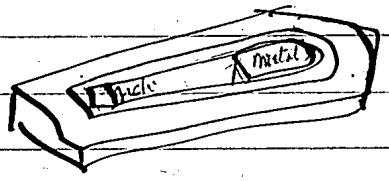


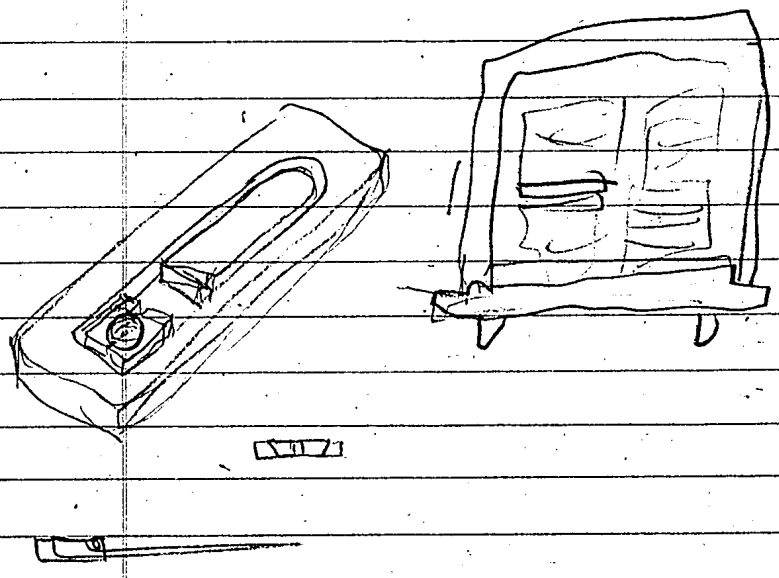
Plumbago moulds for Carbons.



May 16 1881 TAE

Etc Witness
S. D. Mott



3 A
11

Matt

May 16 1881

Witness
S. D. Mayo

Fig 1

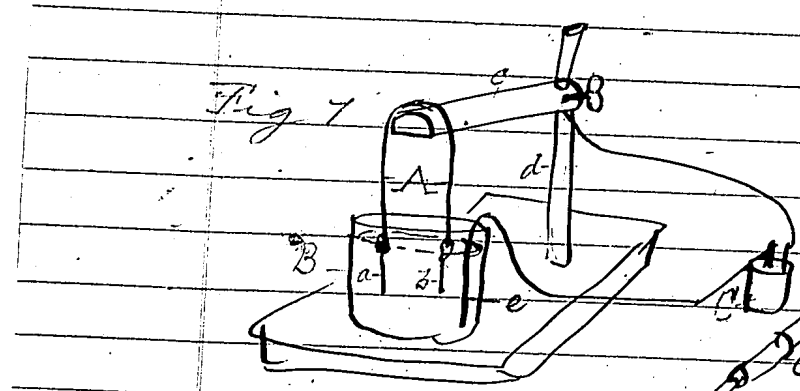



Fig 2.

B17

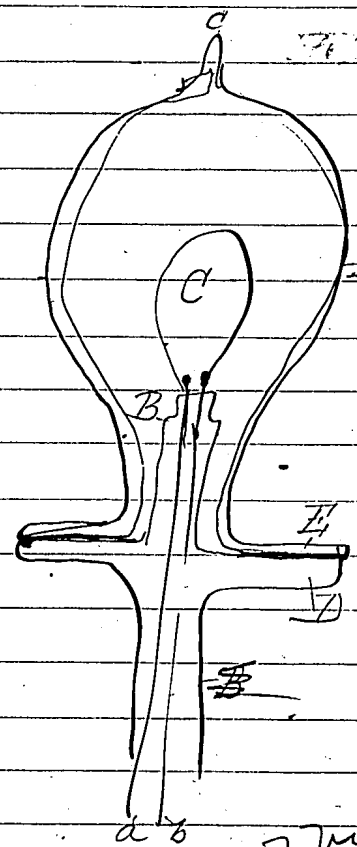



Fig. 3

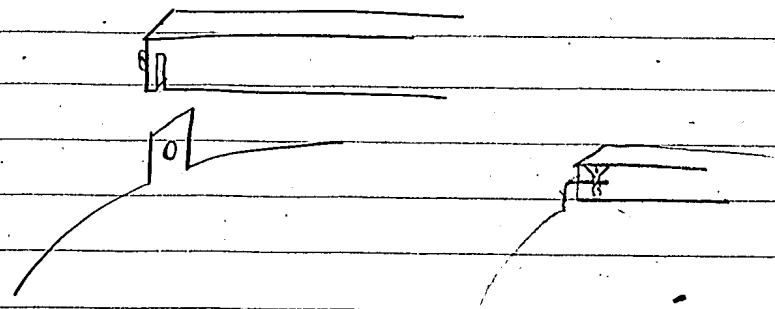
ground flat
Grease always keep
it tight

Vacuum
~~Rubber~~ Sub.
Such as bird lime
liquid
~~rubber~~ rubber or
Paraffine grease

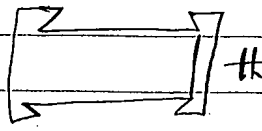
Nov 16 1881
Tel

Witness
A. D. Mott

May 17 1881
TAE



Make detailed drawing
of present steam Dynamo —
Claw coupling of Dynamo
with Engine = Swing pulley
block = Spiral spg in brushes —



the method making Commutator

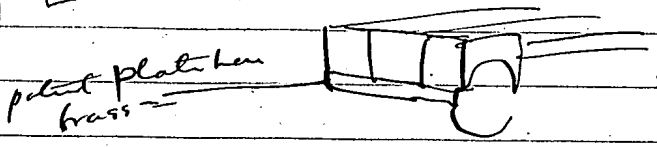
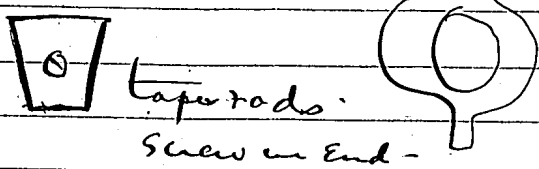
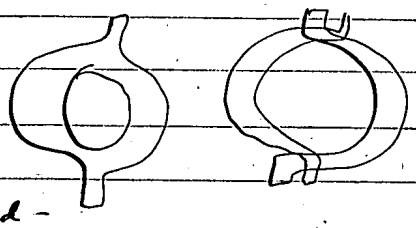


plate platform
brass =

Zinc Cases, non magnetic
Bolts =



Taper rods.
Screw on End —

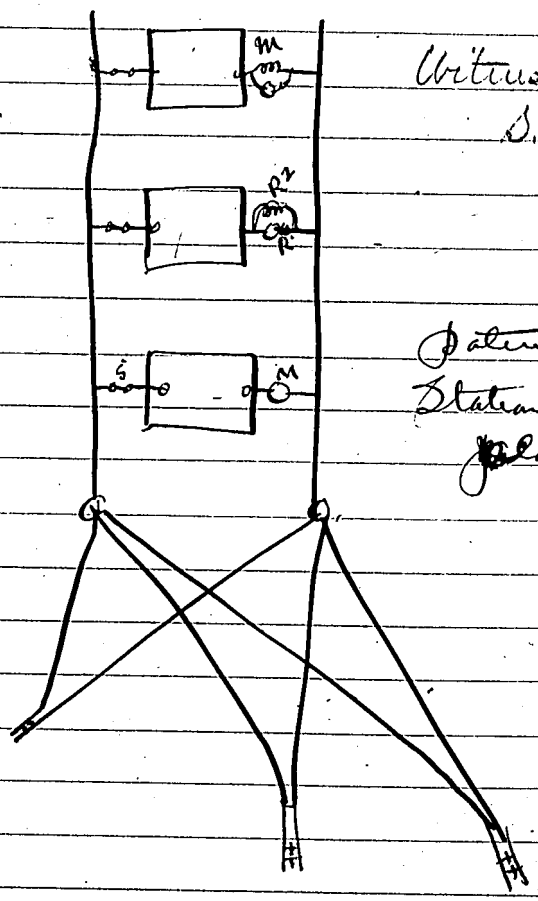


the two

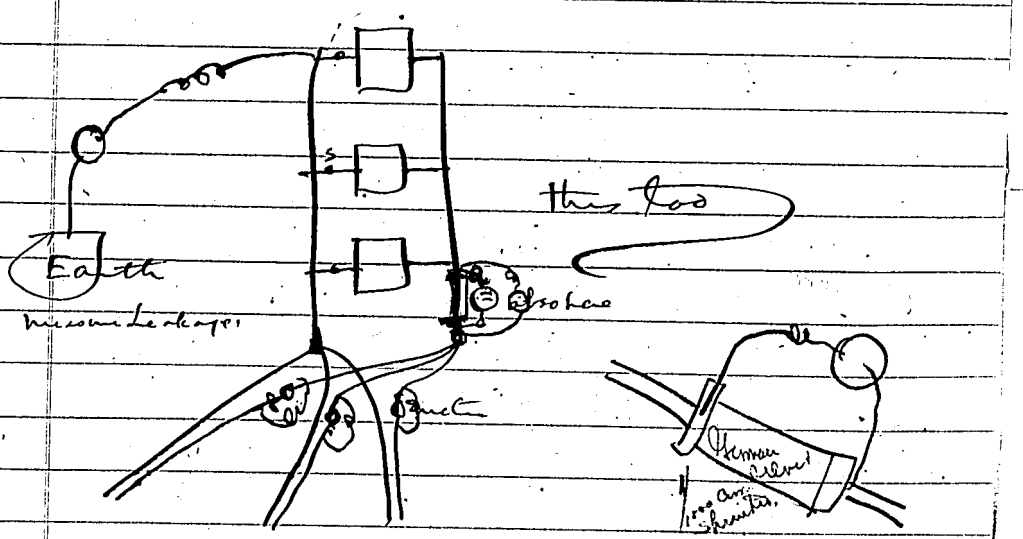
Covering surface iron with mica — mica
between gun iron —

May 17 1884

Witness
S. D. Mott




Patent 1
Station meters
Place 6 port



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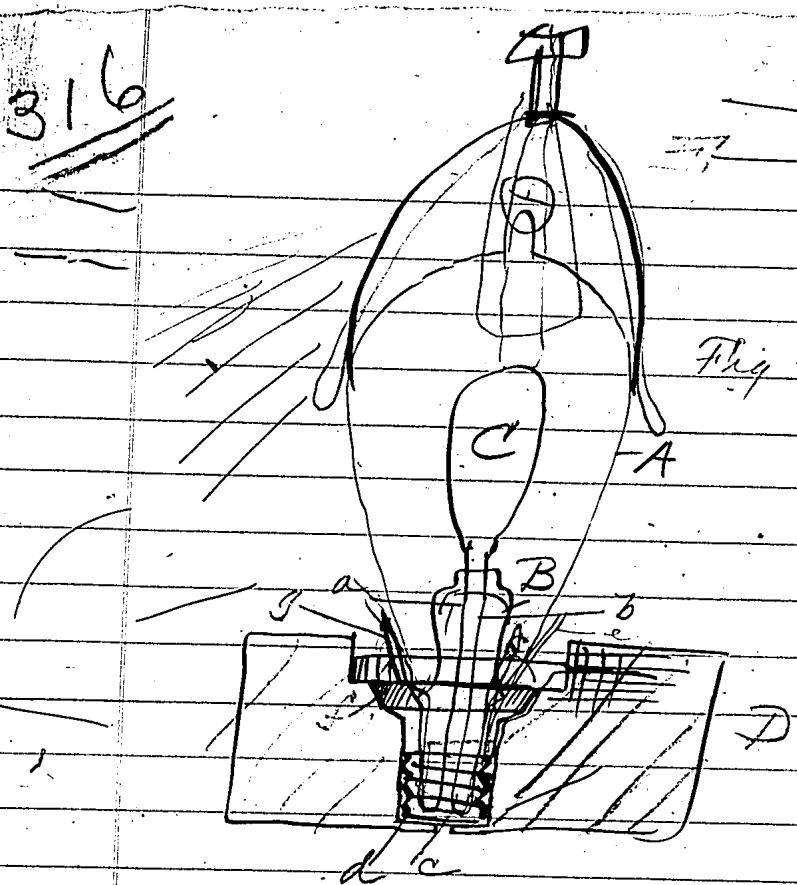
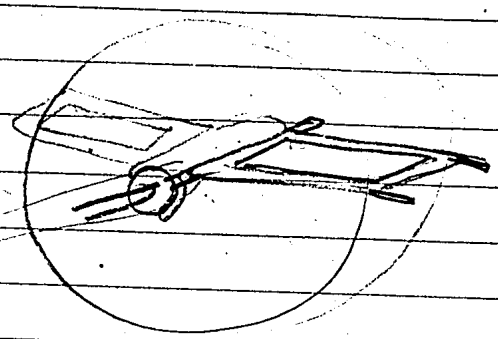



Fig 1.

Witness
S. D. Mott

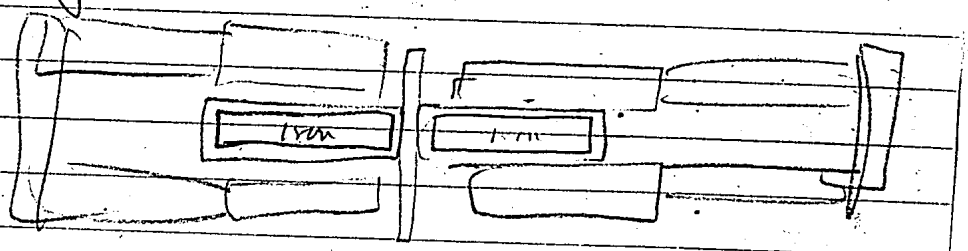
Moulding Socket on Lamp
May 17 1861 Patd

Make figure 2 a section of the lower end of lamp and socket near socket complete, no claim is claimed to the Paris Socket



May 18 1881 905

Radial bars like a printing chase. inner bit



— May — 1881 —

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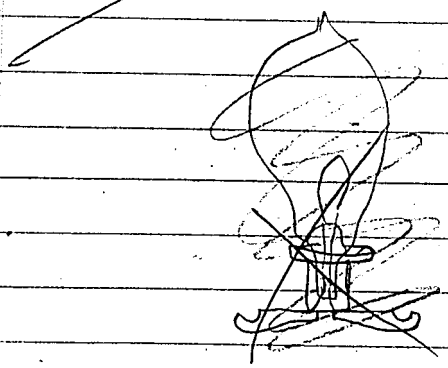
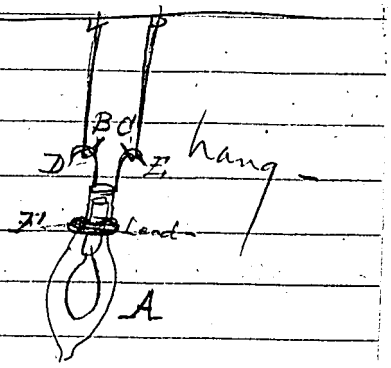
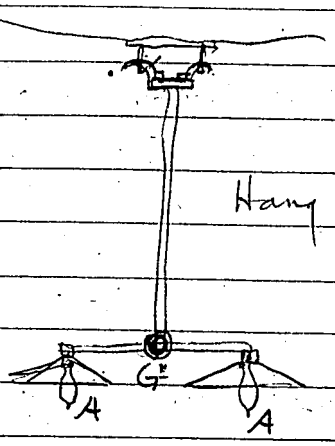
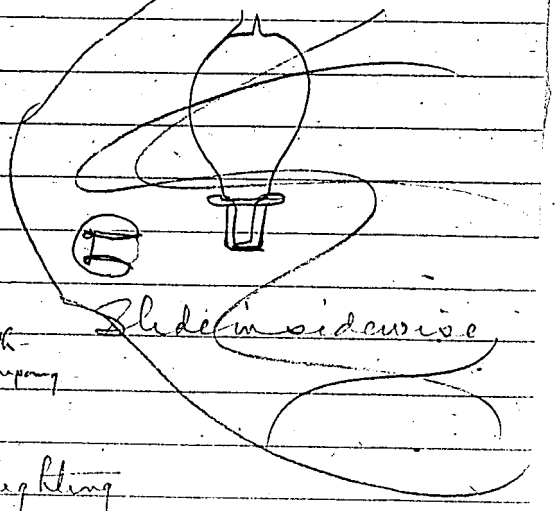
May 19 1881 [illegible]

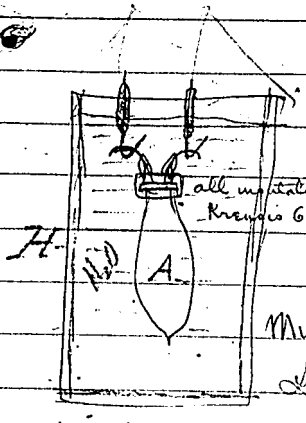





Witness
S. D. Mott

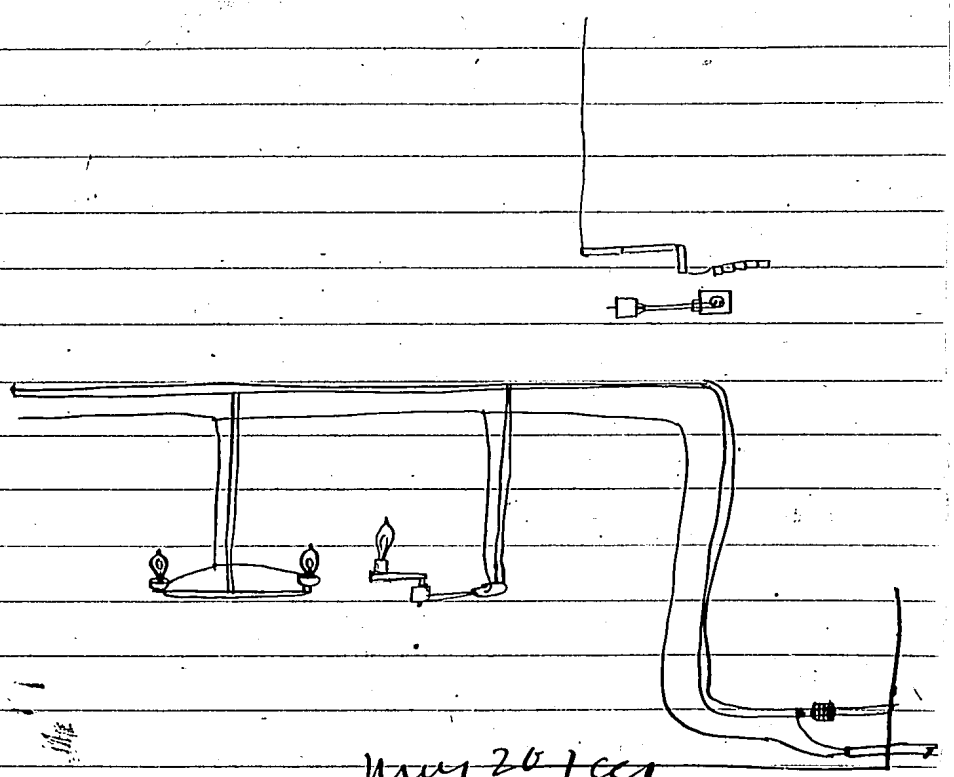



Mine Lg Hang
Lamp with Wire

100 105



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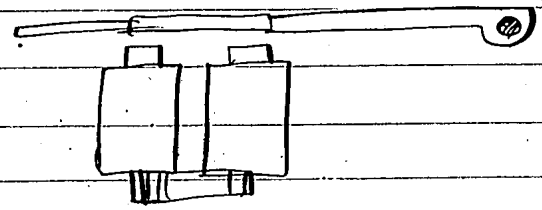
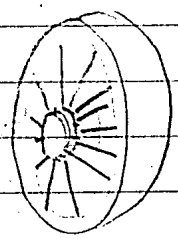
May 20 1551 JAR





Witness
S. Dillon — Dese Dynamo —
May 20 1881 TAE

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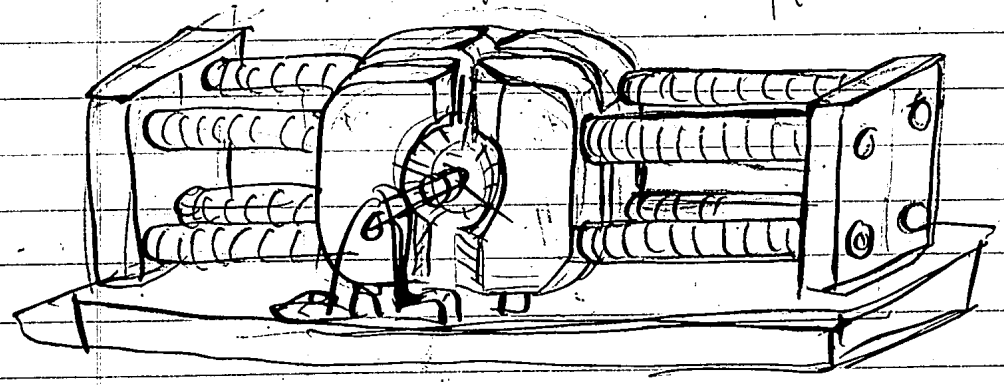
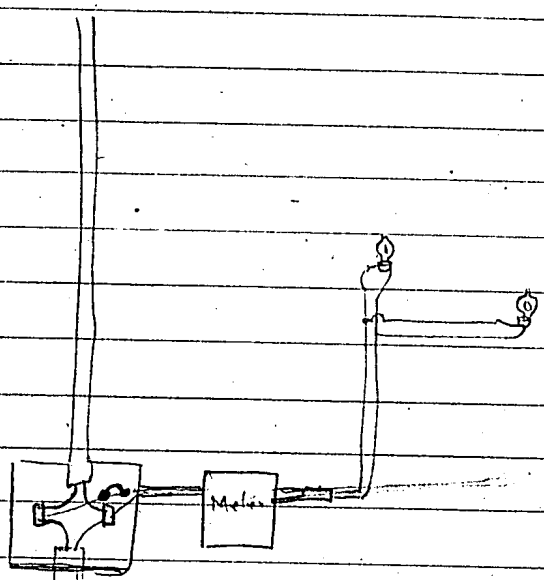
Thos — Field —

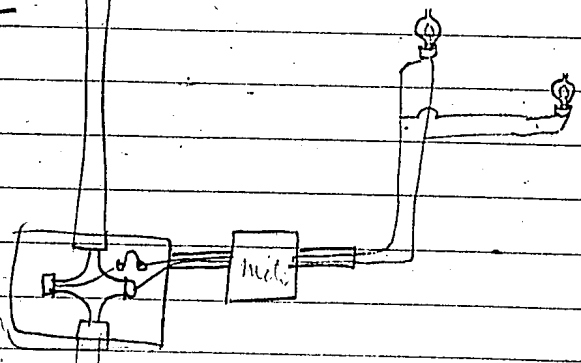


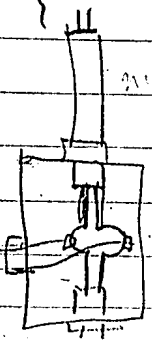


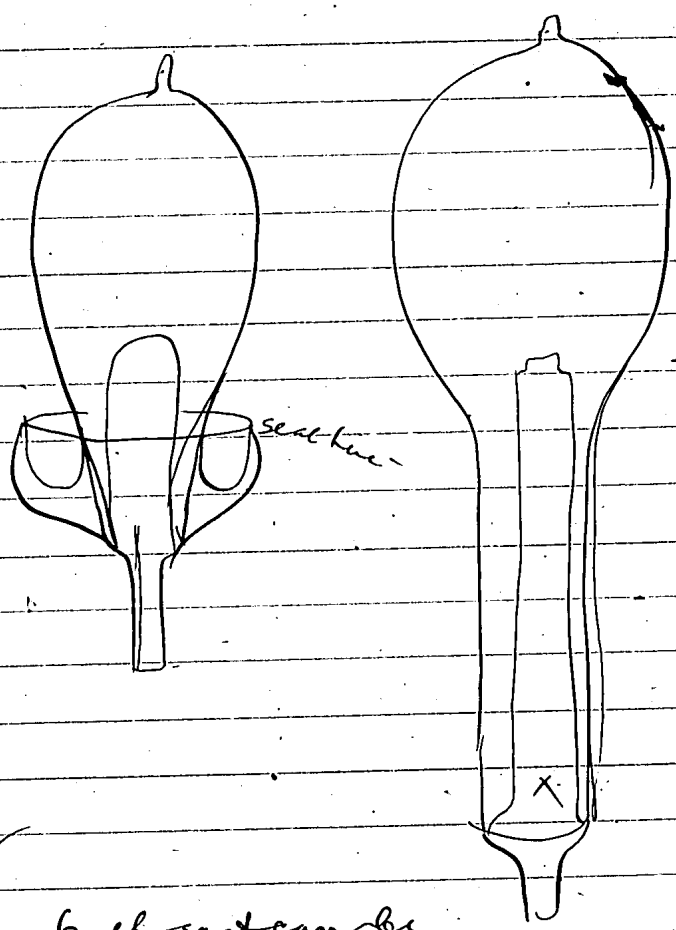
May 20 1881

T.A.E

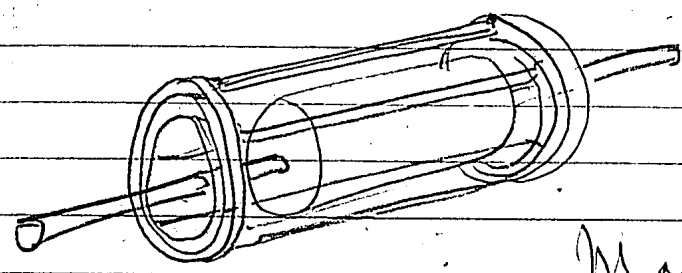
S.D. Mom-



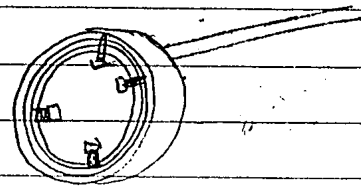


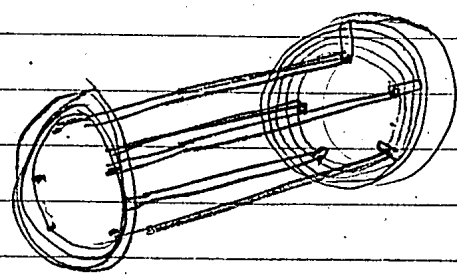


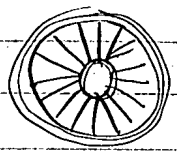

Long bulb seal can be
cut off + used many times
May 20 1881 PAE

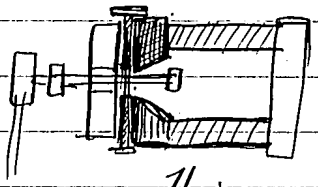


May 20 1861
TAE









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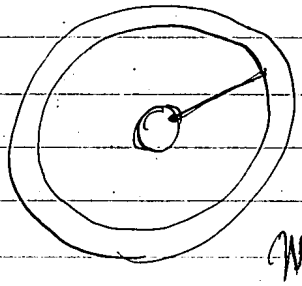
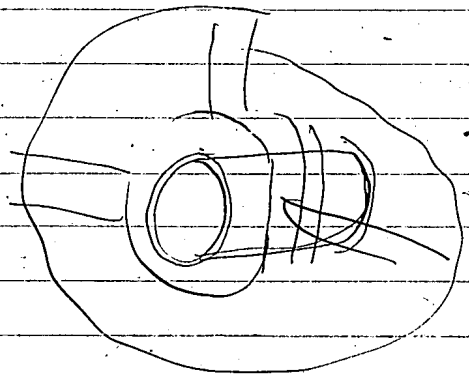
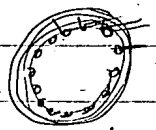
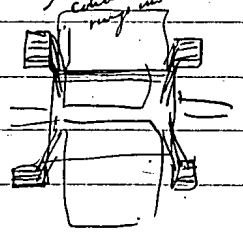


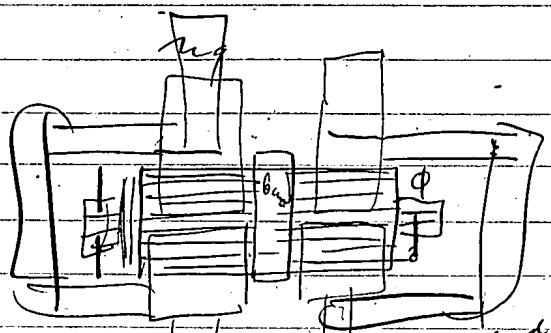
May 20 1881





This way we
reg machine for
winding tools
may instead of plate

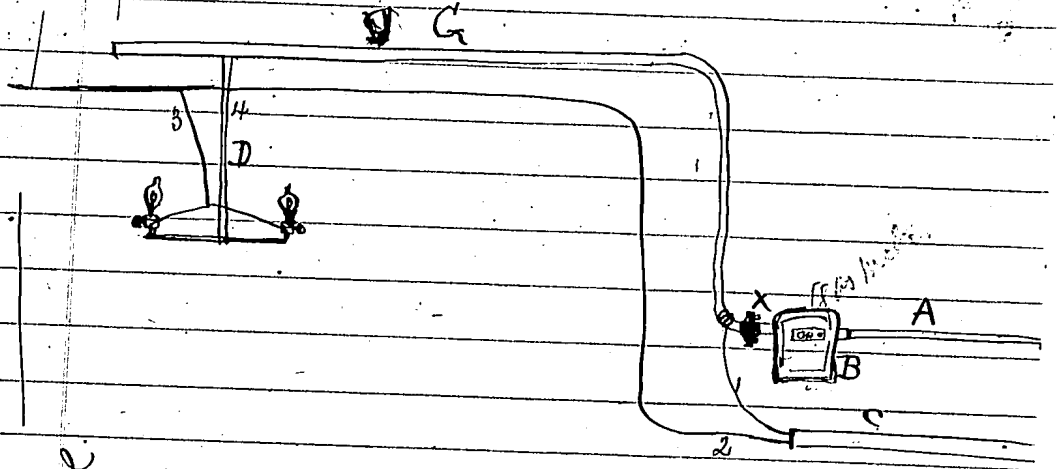





Reg - Use principle applied to
Regnault's boats in middle -
but only 1 Commutator

Case No. 324

Using Gas pipes in House only

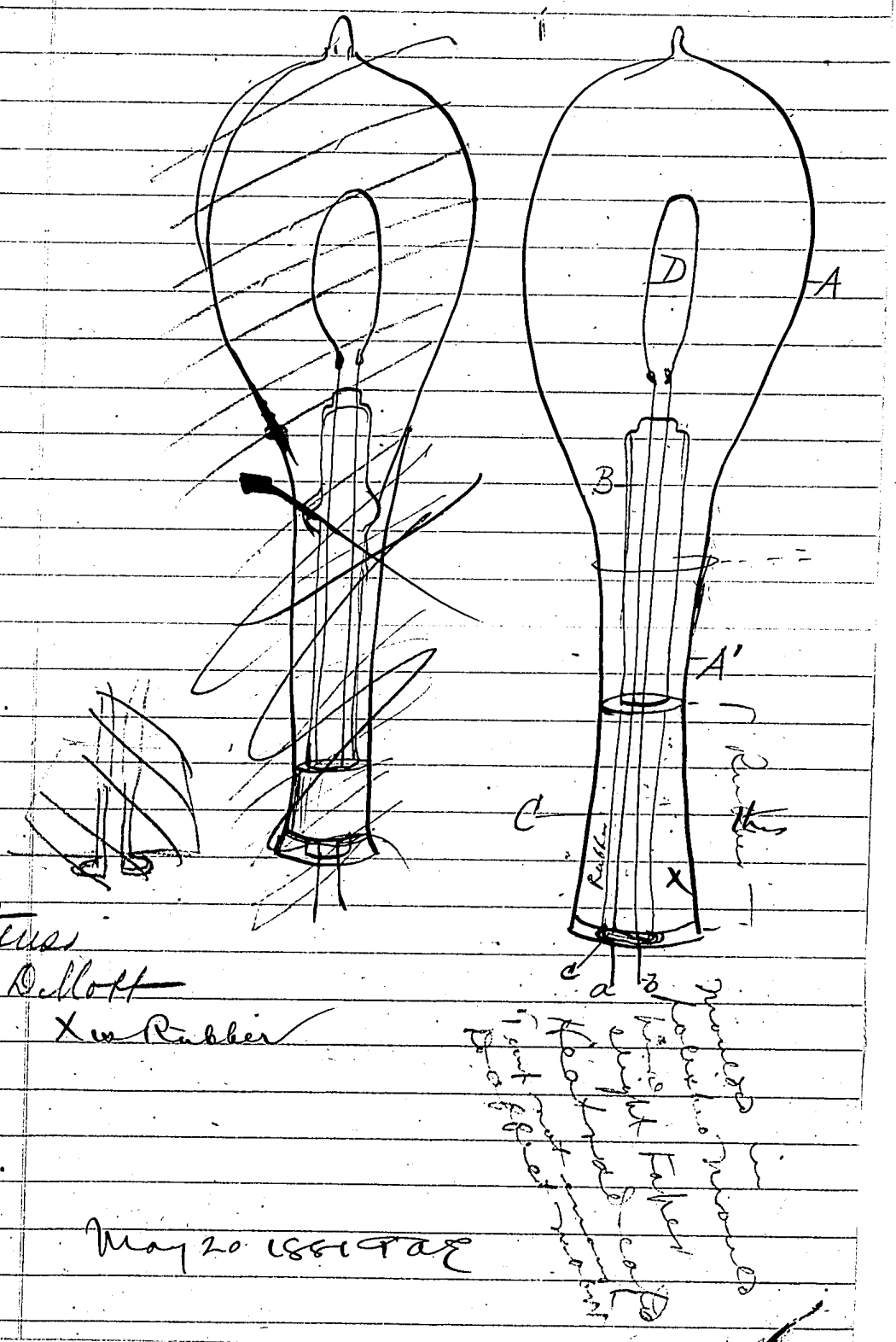



Insulating joint put in Gas pipes at Gas meter C by the Electric man G the gas pipe —

May 20 1881 Tax

Witness
S. D. Mott

820




Witness
S. Dellorf
X. Rubber

May 20 1884 Page

322 322

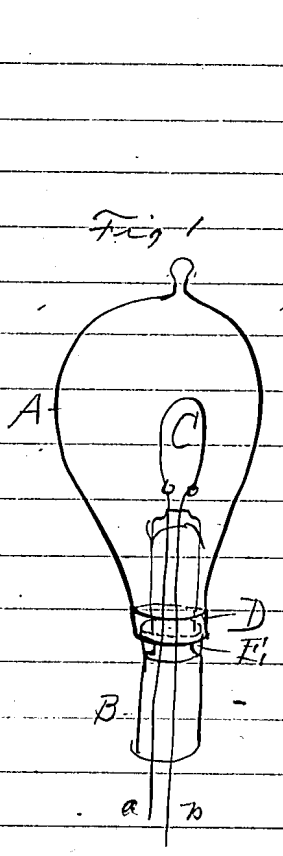



Fig 1

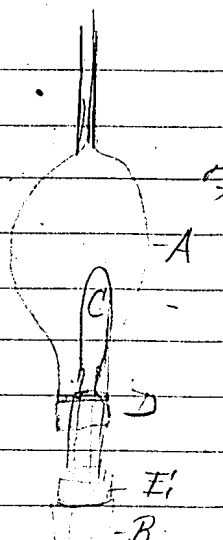
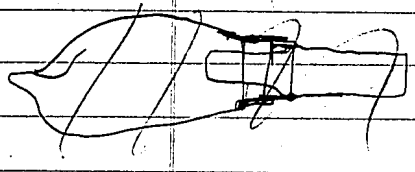



Fig 2

Platina seal
a b

Soldering two platinum rings together =

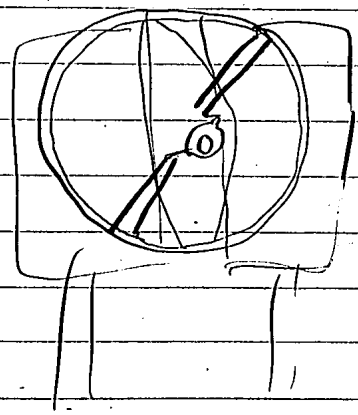


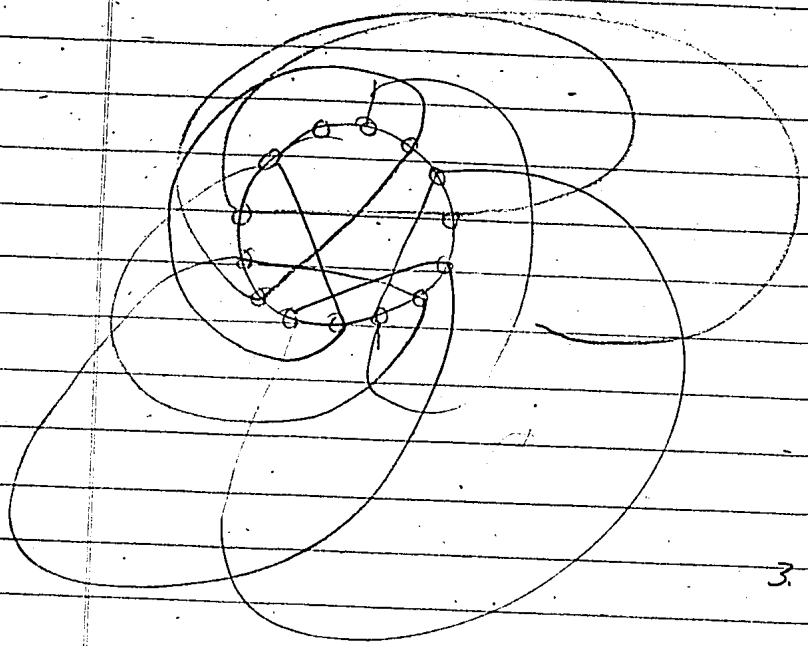
Witness
S. D. Mott

M.

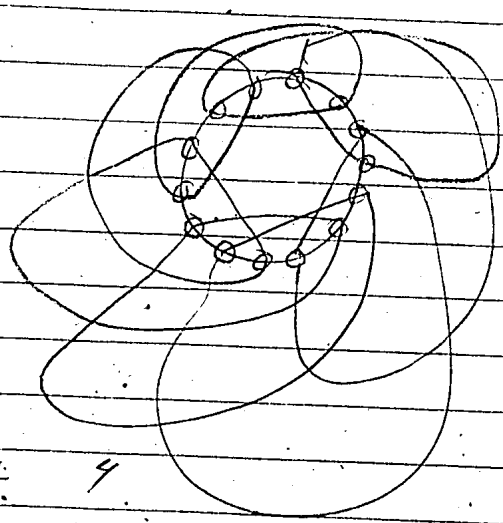
May 20 1881 Tate

Rubin
Taken apart
by hydrofluoric acid (hydrofluoric acid)





3 1/2



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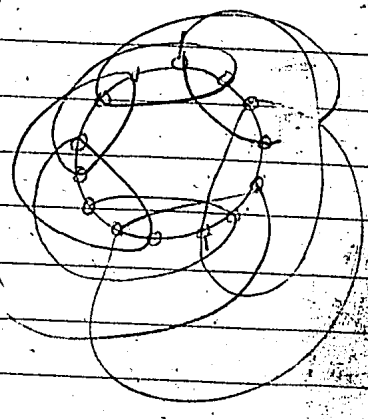

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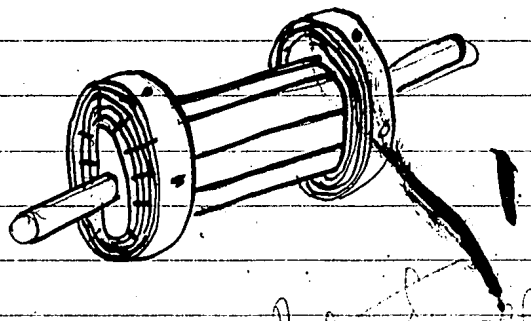
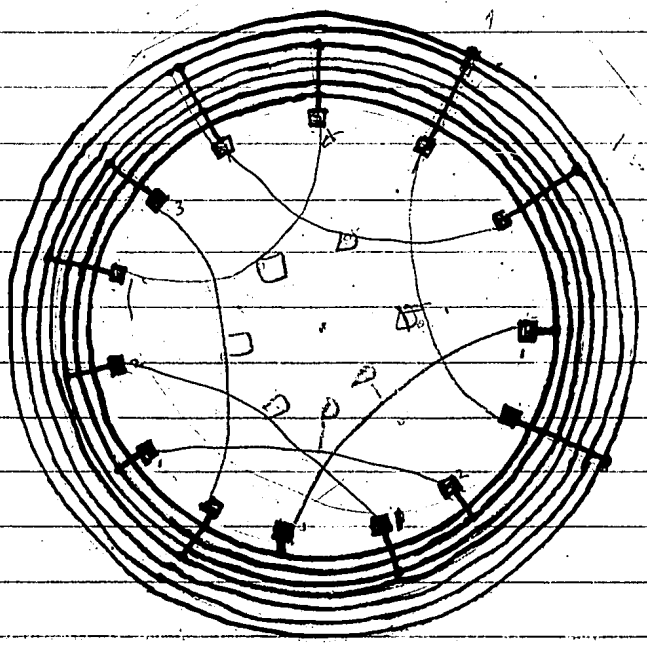
3

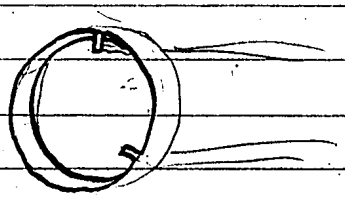
May 21 1882 Pat

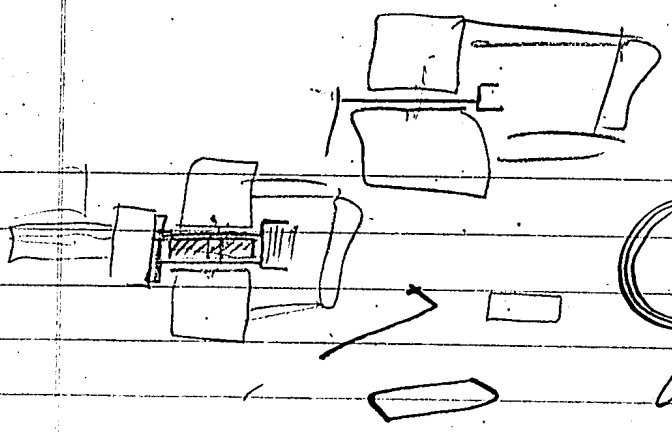
Witness S. D. Mott



Patented

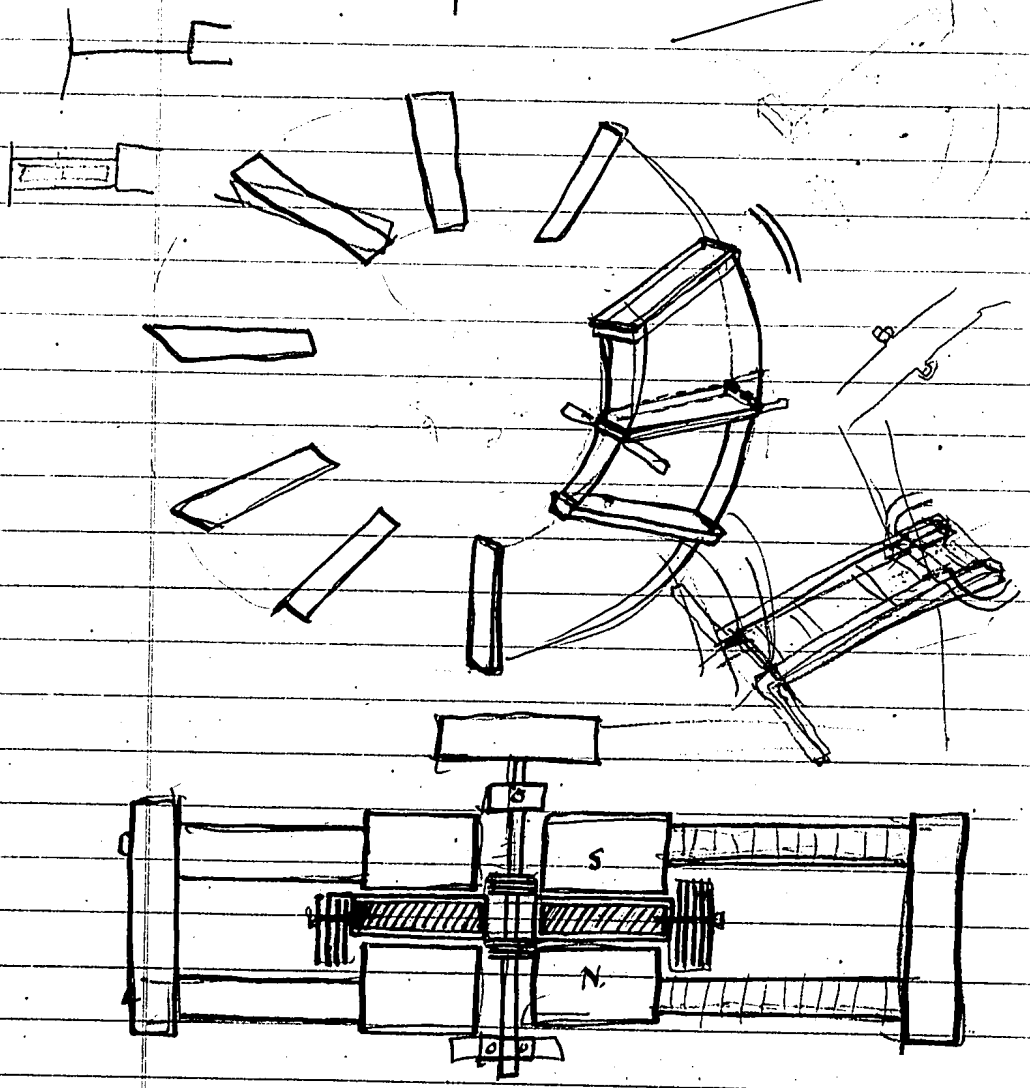




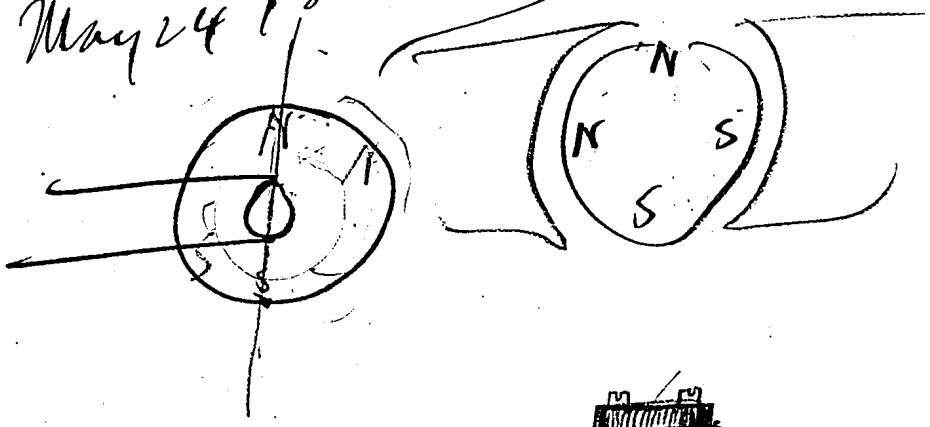



Witness
S. C. Mott

Patent May 21 1881



May 24 1881

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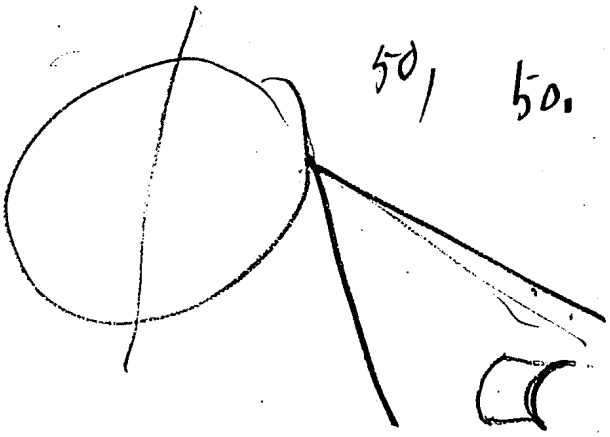

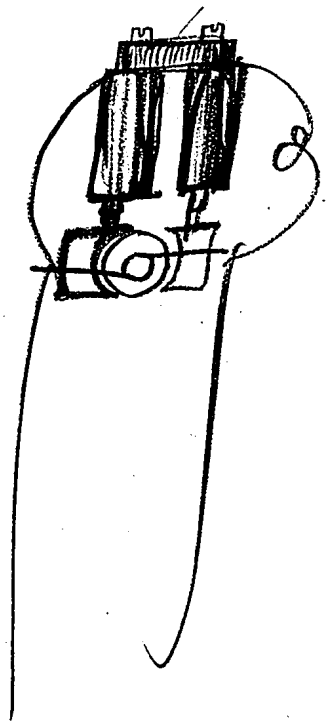

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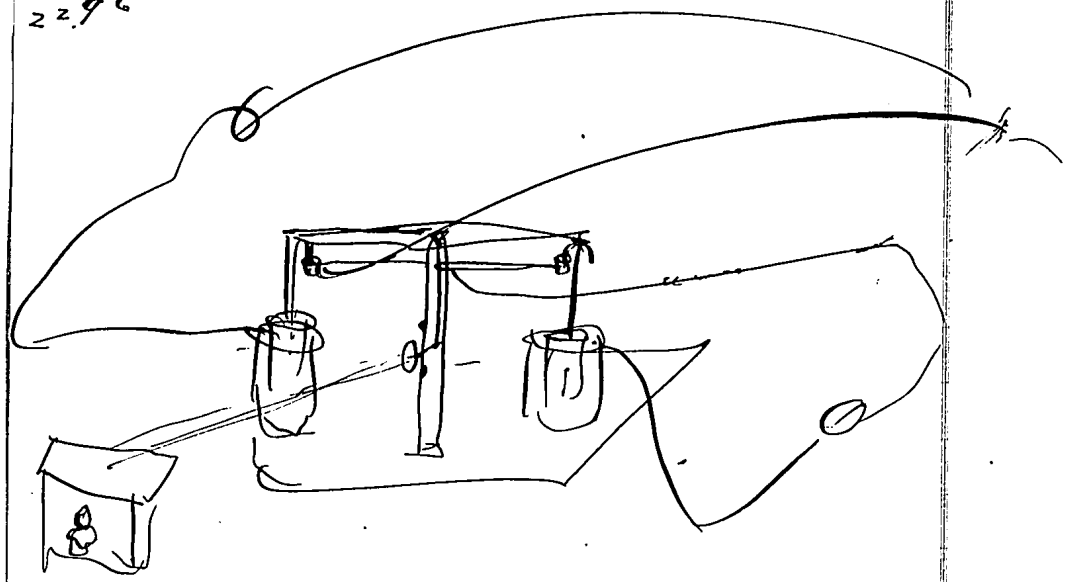
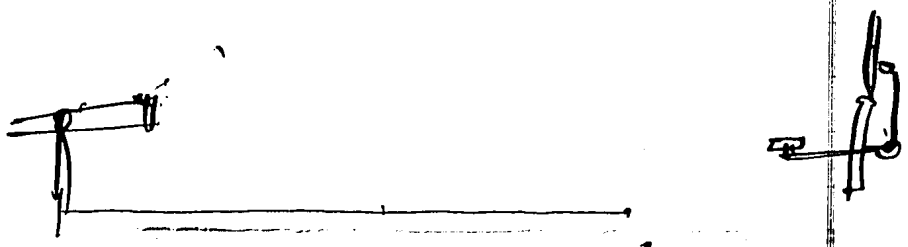
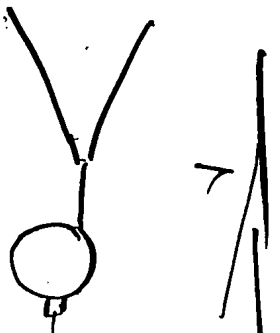
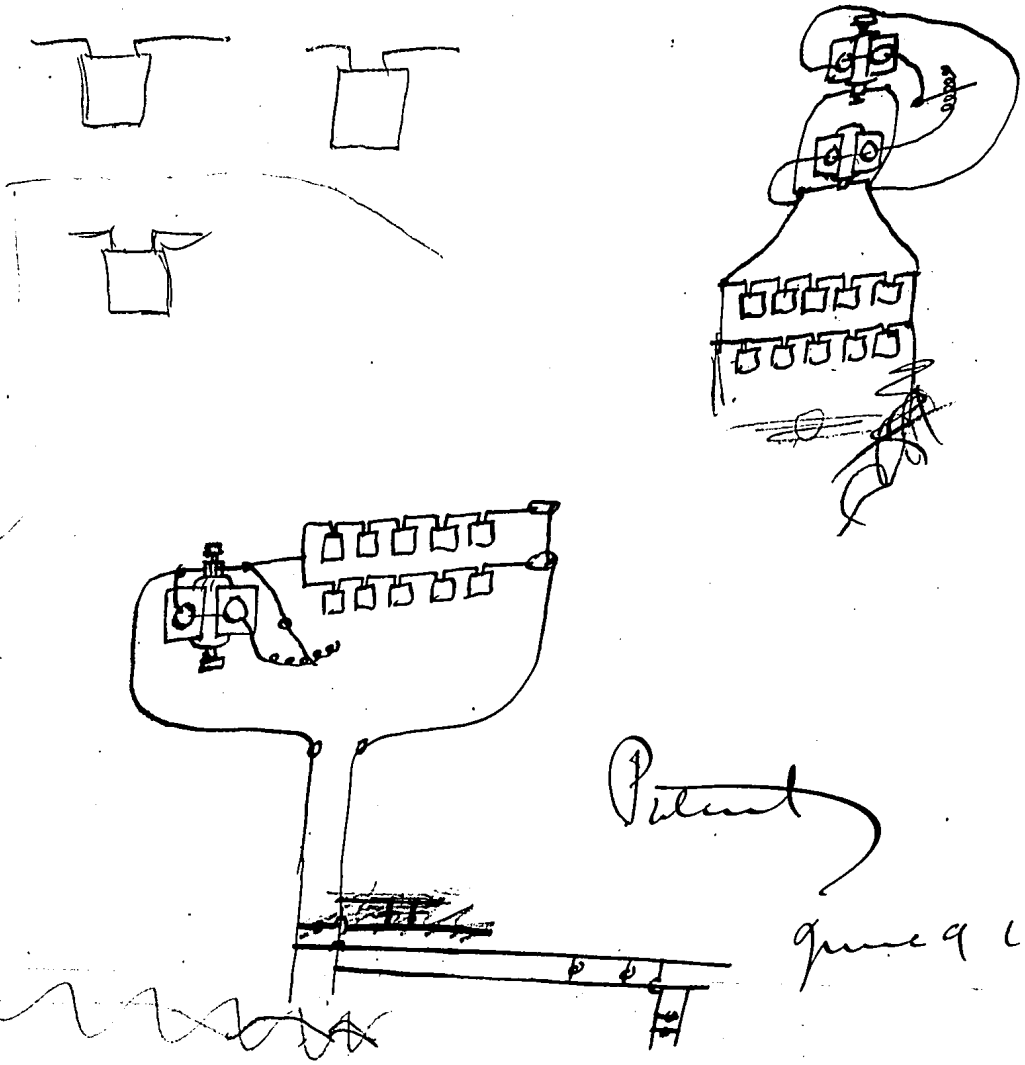




May 24 1881 T&S

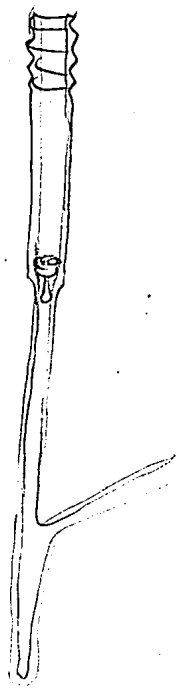


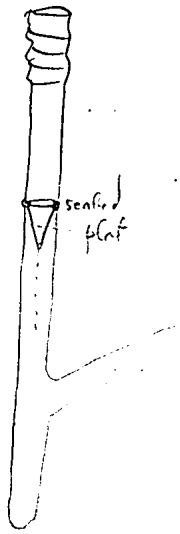


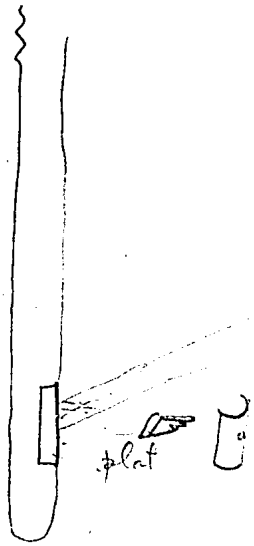

– June 1881 –

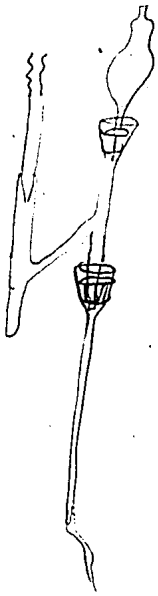
June 4 1851

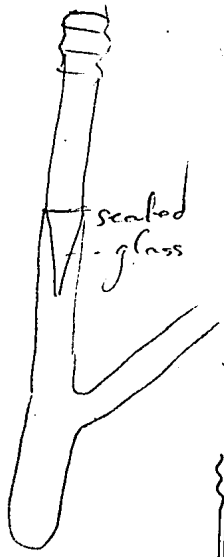
Tap

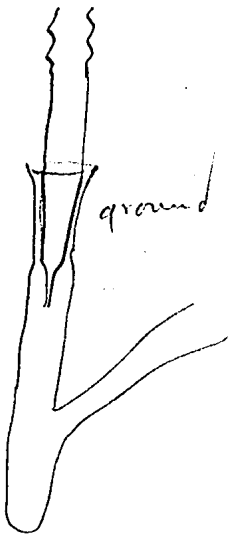


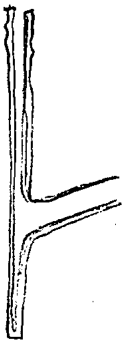


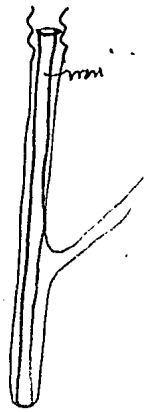



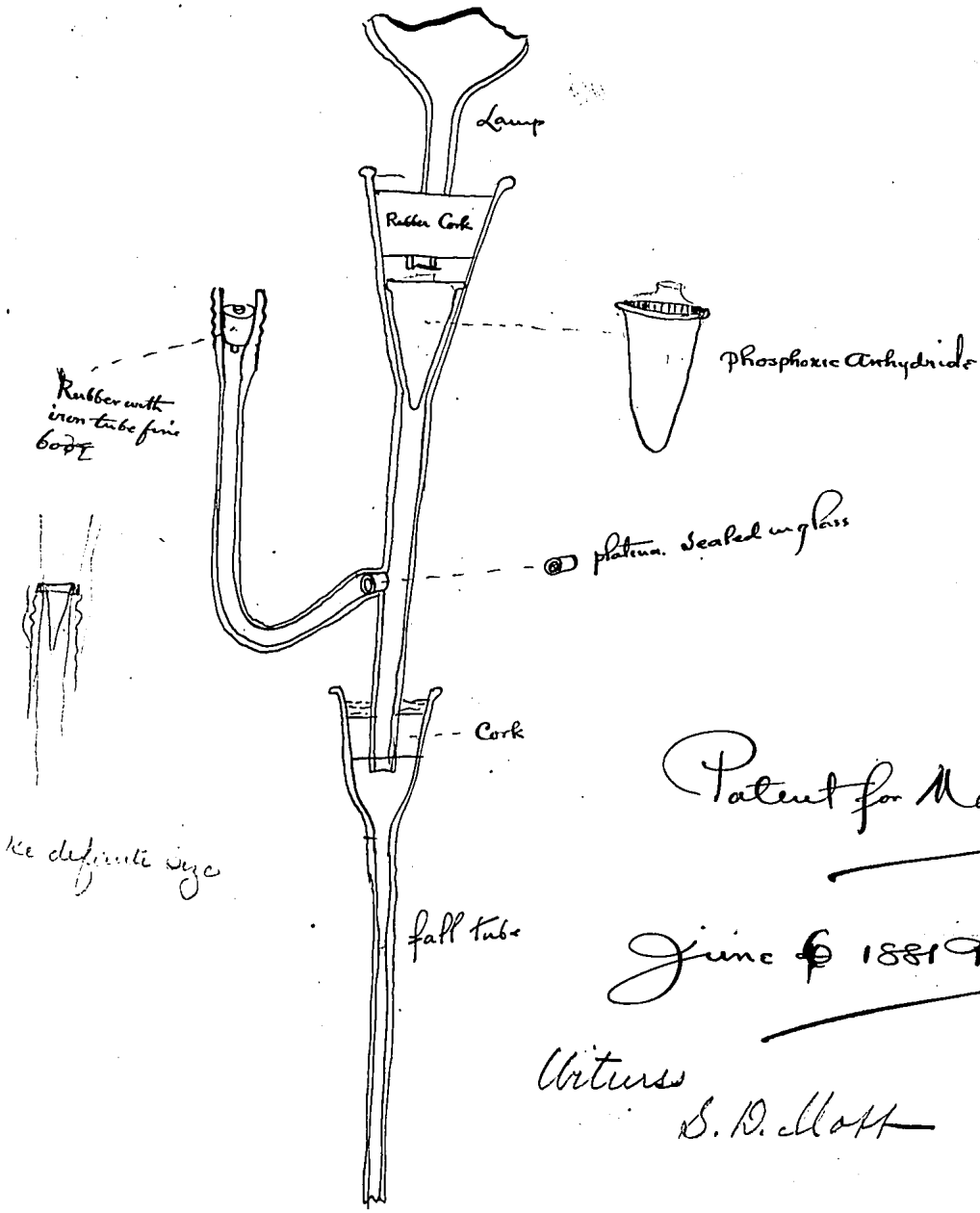










Patent for Matt

June 6 1881 [illegible]

Witness
S. D. Matt

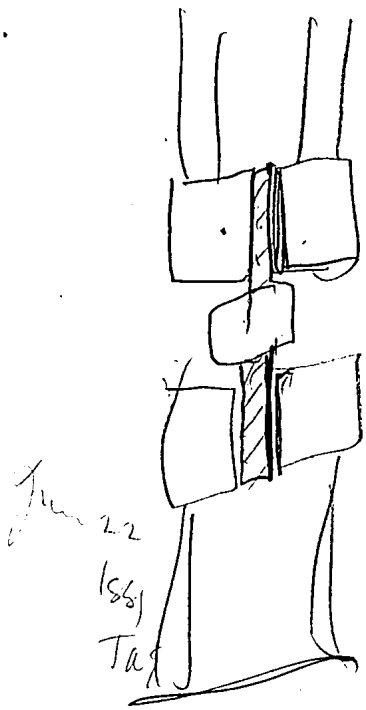
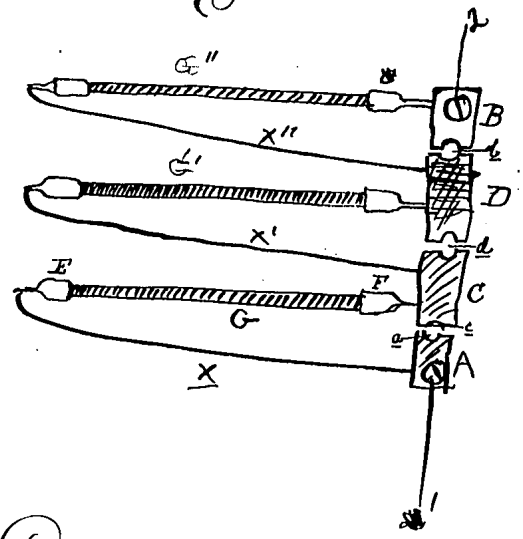


Fig 2.2
ISS
Tag

Case 330

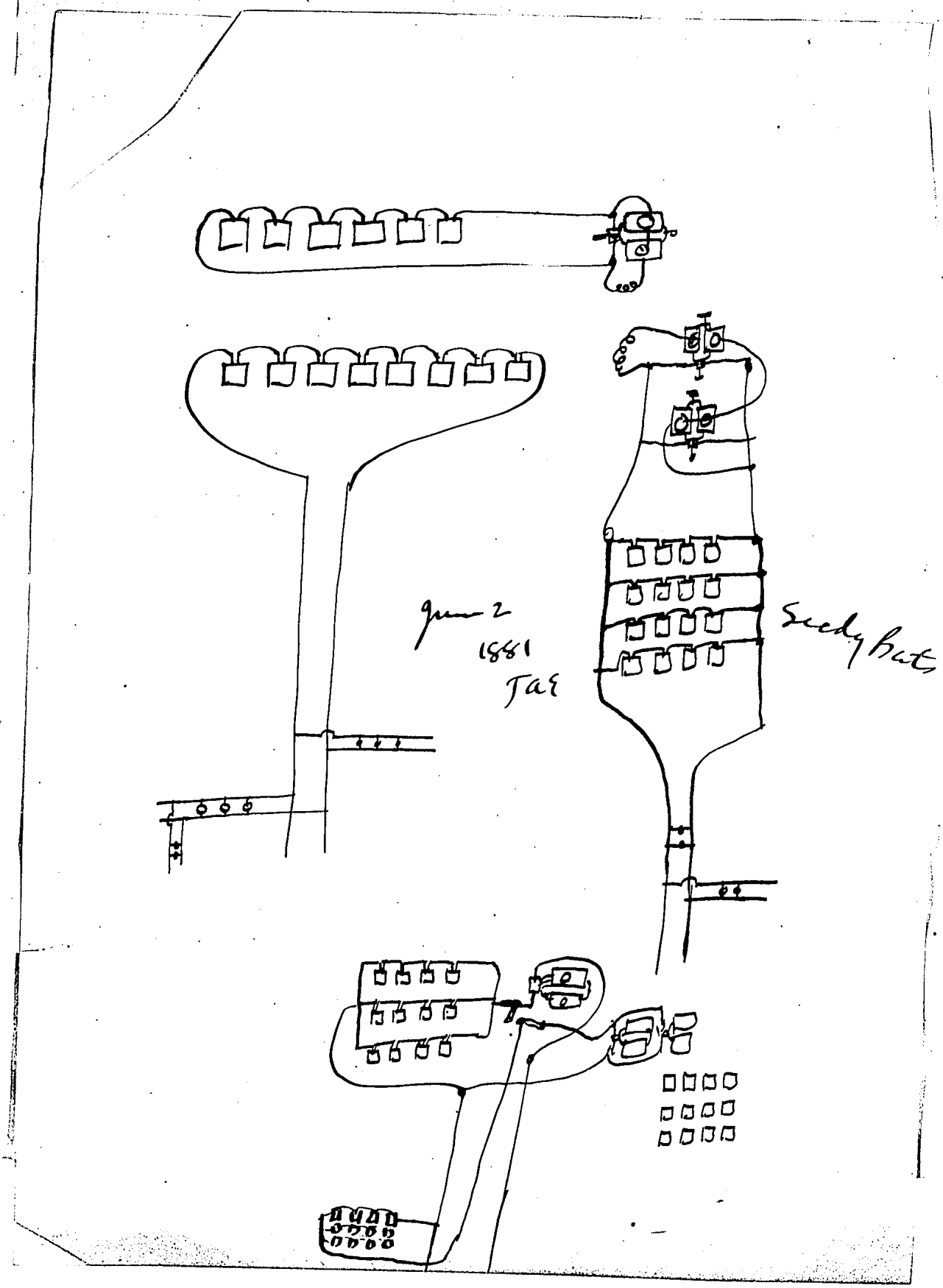
Drawing for patent

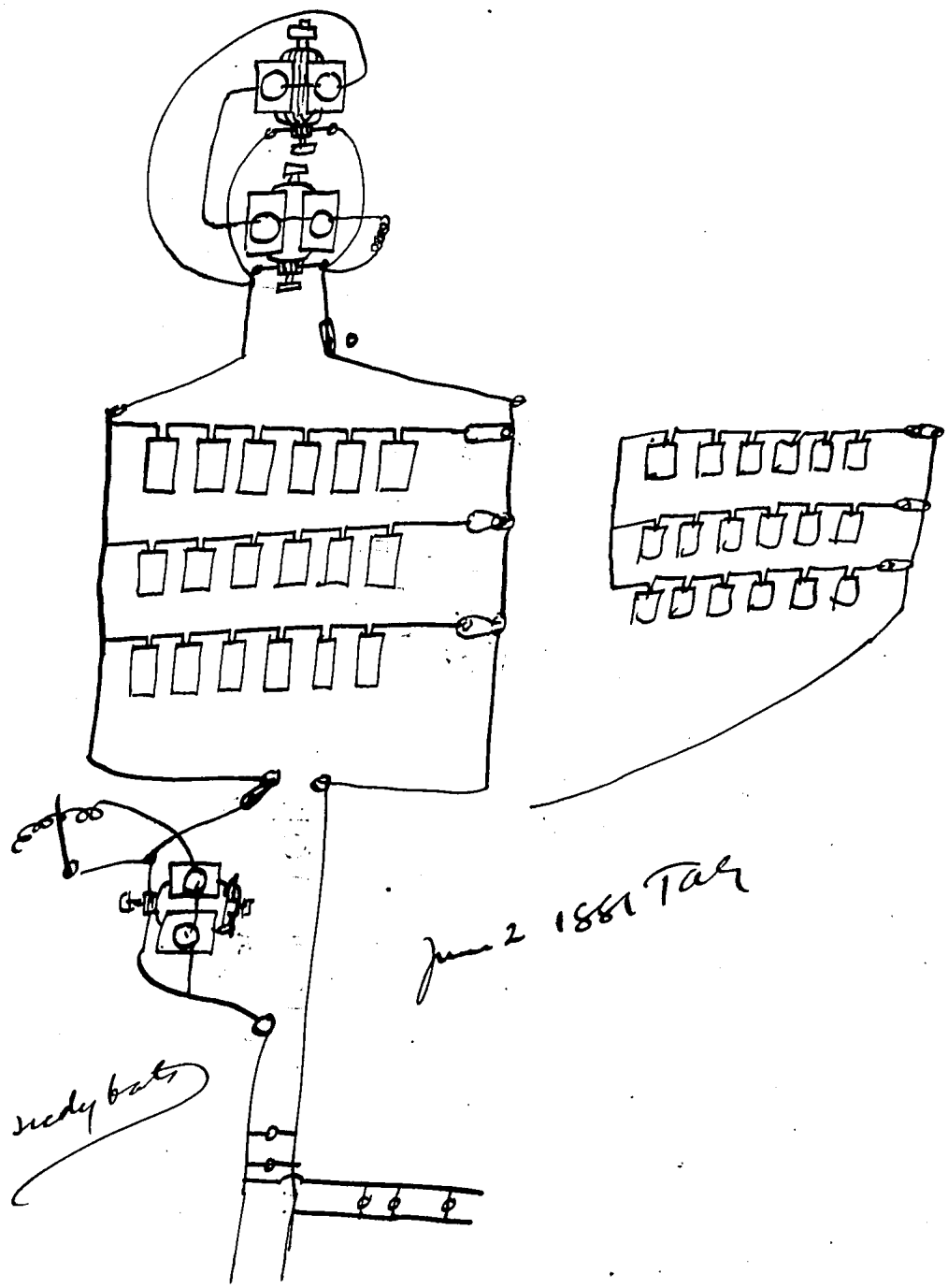


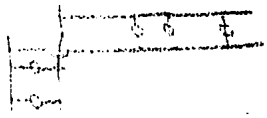

Carbon Rheostat, Copper plated Ends
Platinum Screws E E' are the Ends X
the cores, G the Carbons of plumbago
or a Carbonized Material=

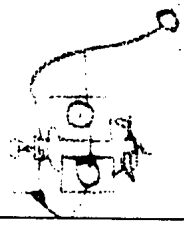
NY June 3 1880 Pat

Witness
S. E. Mott


June 2
1881
Jar
Seedy Bat


June 2 1861 Tar
study bat

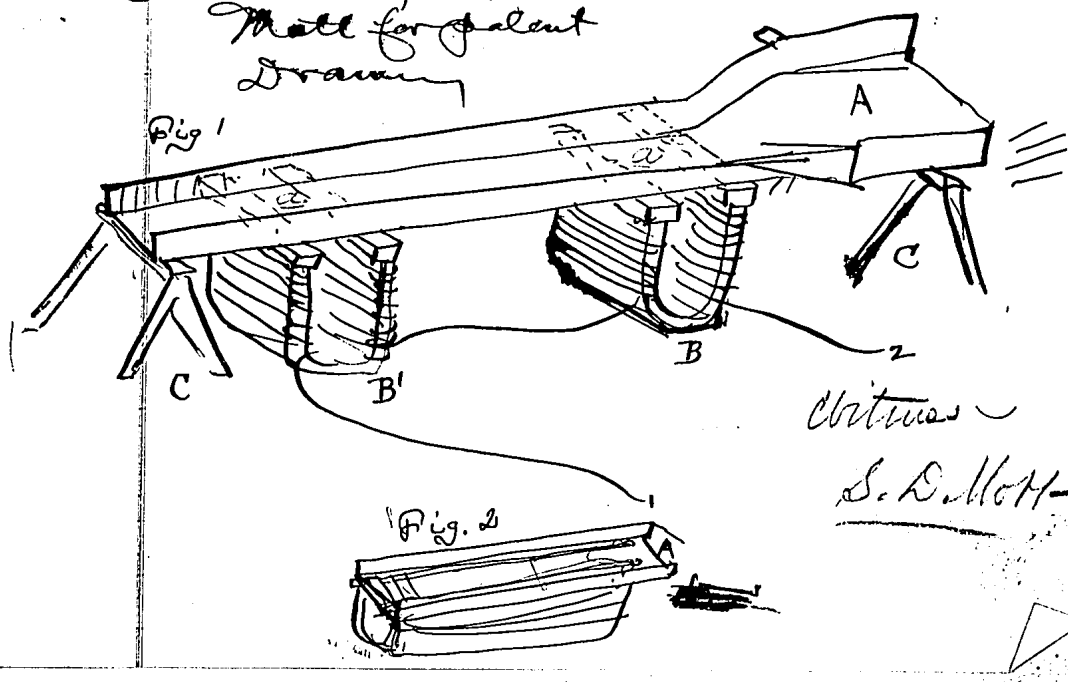


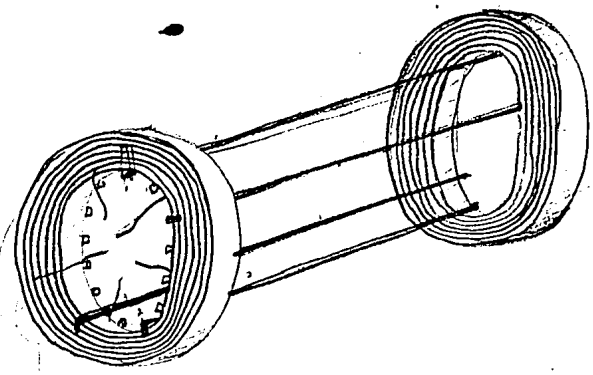


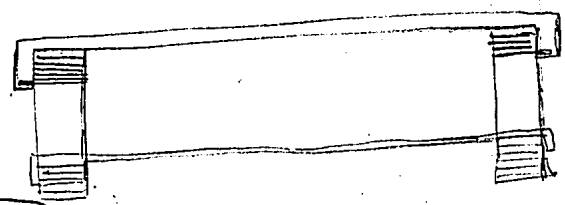
June 3 1861 —
Tab
Model for patent
Drawing

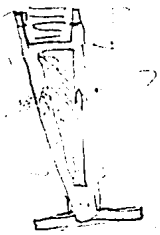
Case 329.

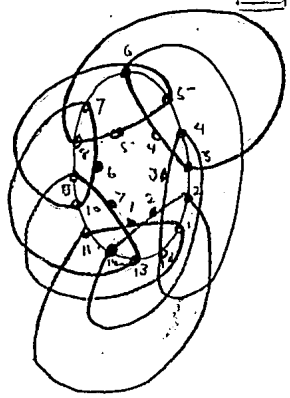
Witnesses
S. Dillon









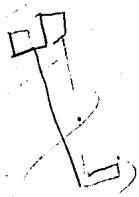


Matt

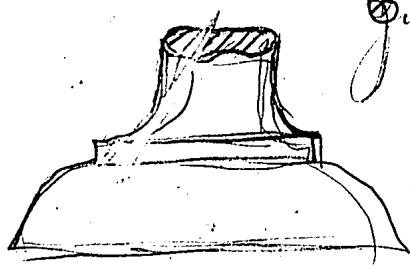
Drawing patent

June 4 1881

TAE



Witness
S. D. Mott



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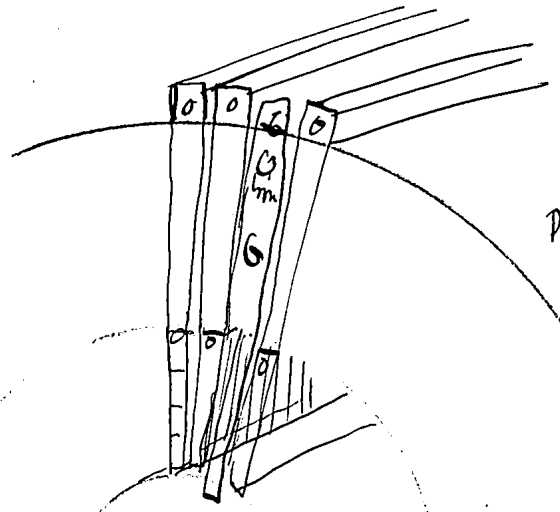
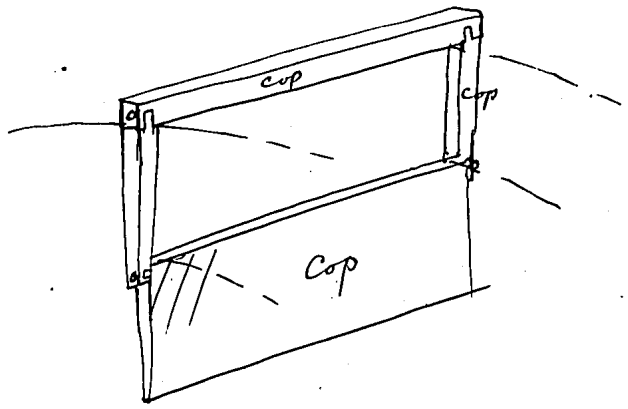


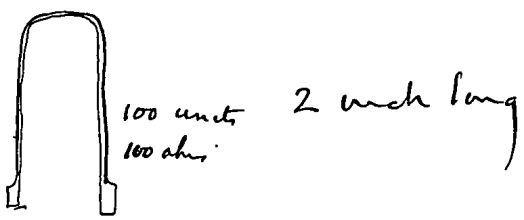
Patent
June 6 1881
J.E

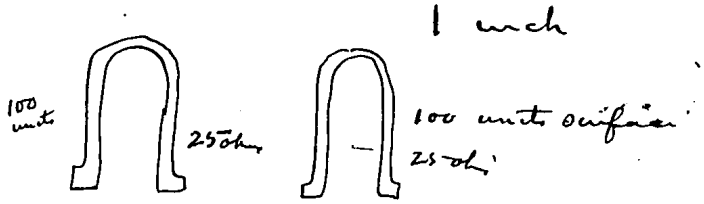


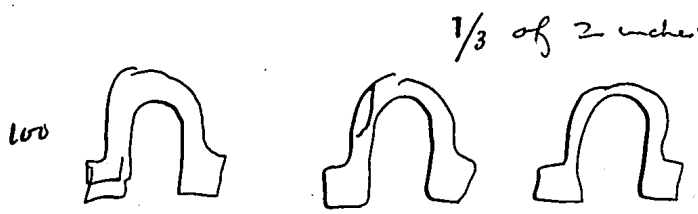
DYER & WILBER,
American and Foreign Patents and Patent Causes. } 519 7th St., Washington, D. C., and 65 Fifth Avenue, New York.

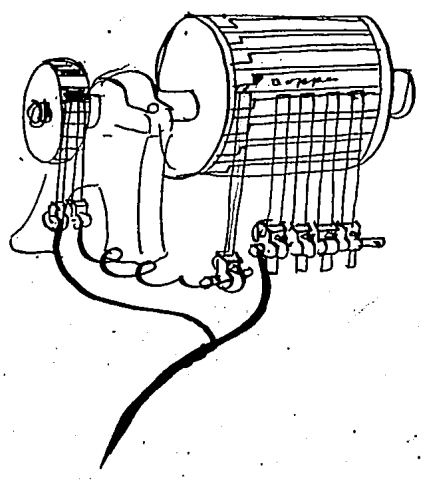
Z. F. WILBER,
No. 65 FIFTH AVENUE,

New York, June 16 1881





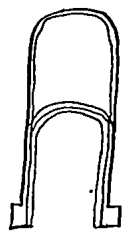
New York
July 2 1881
Witness
S. D. Mott

DYER & WILBER,
American and Foreign Patents and Patent Causes. } 519 7th St., Washington, D. C., and 65 Fifth Avenue, New York.

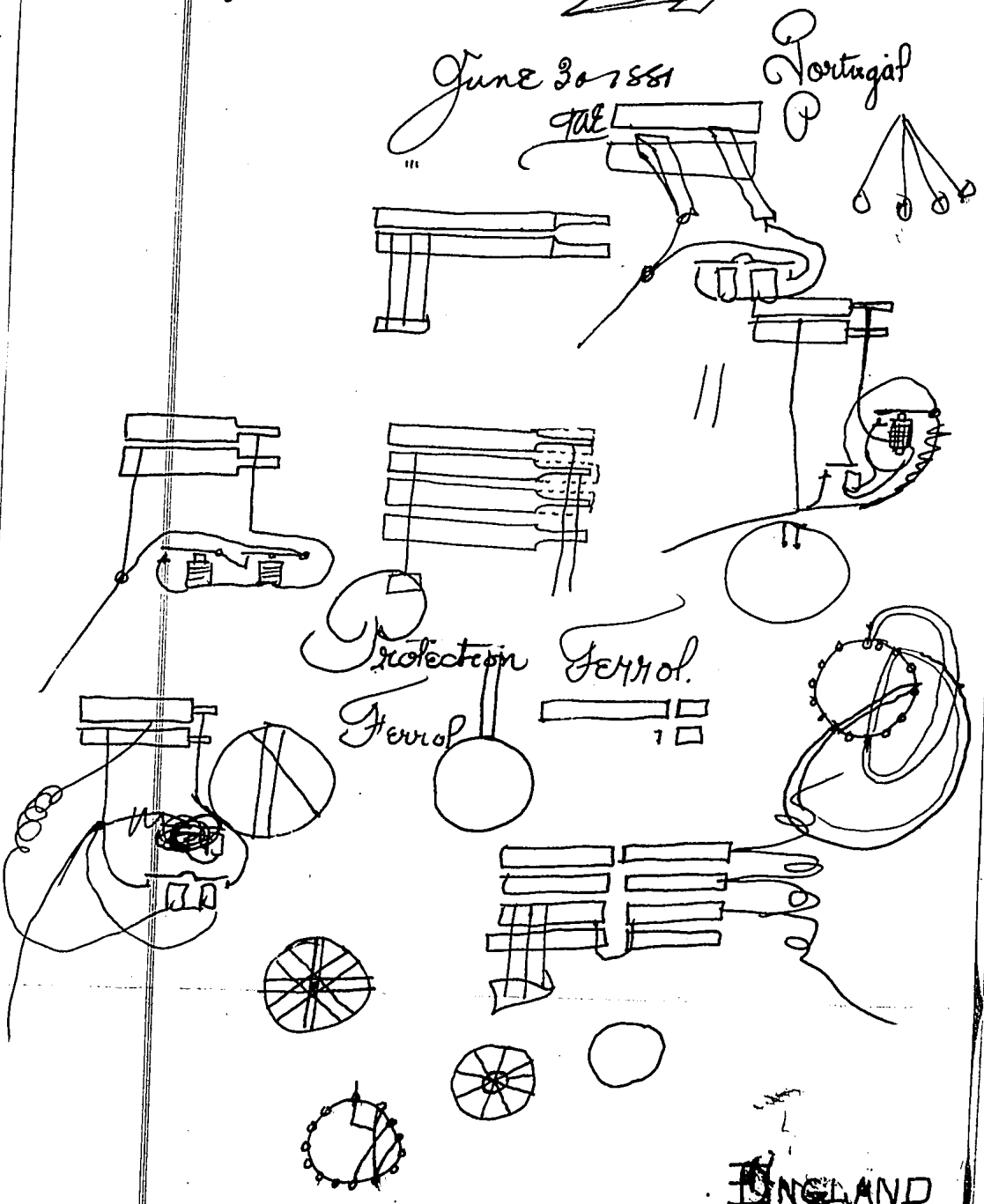
Z. F. WILBER,

No. 65 FIFTH AVENUE,

*New York,* ..... *188*



Object do away with the spark on a Dynamo Machine,



1881 June

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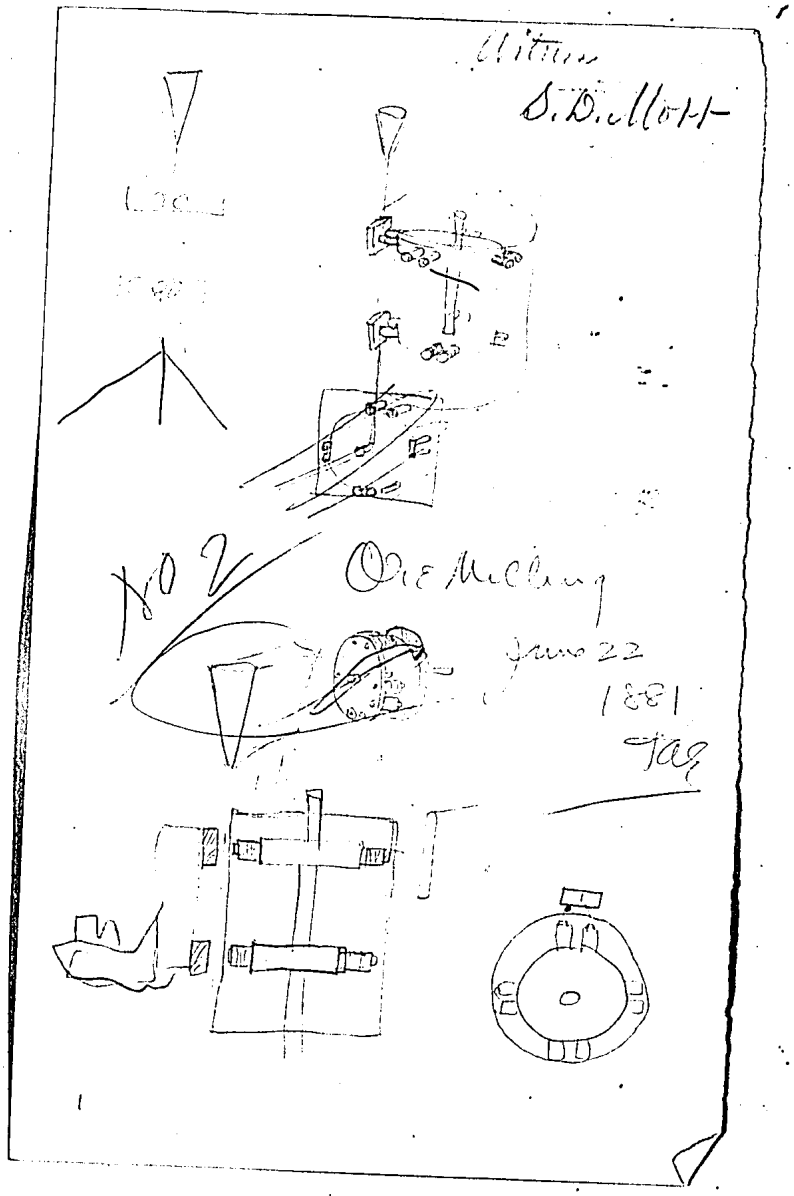
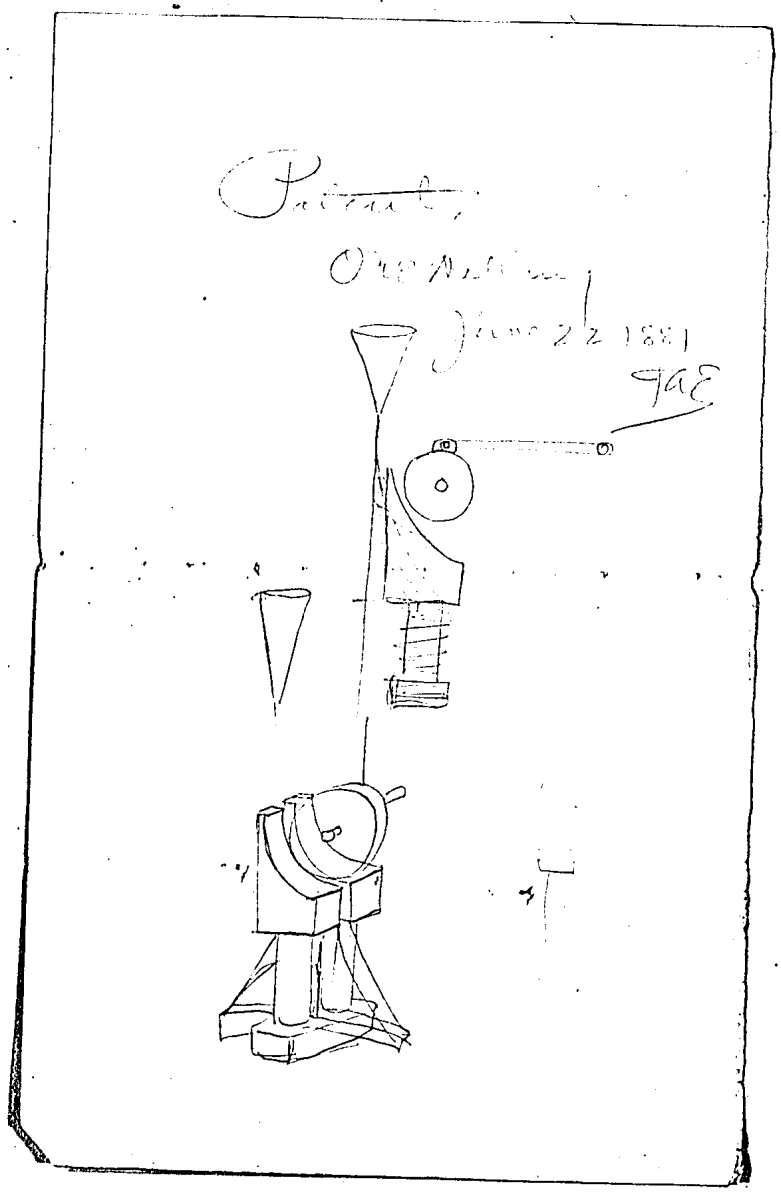
June 22 1881

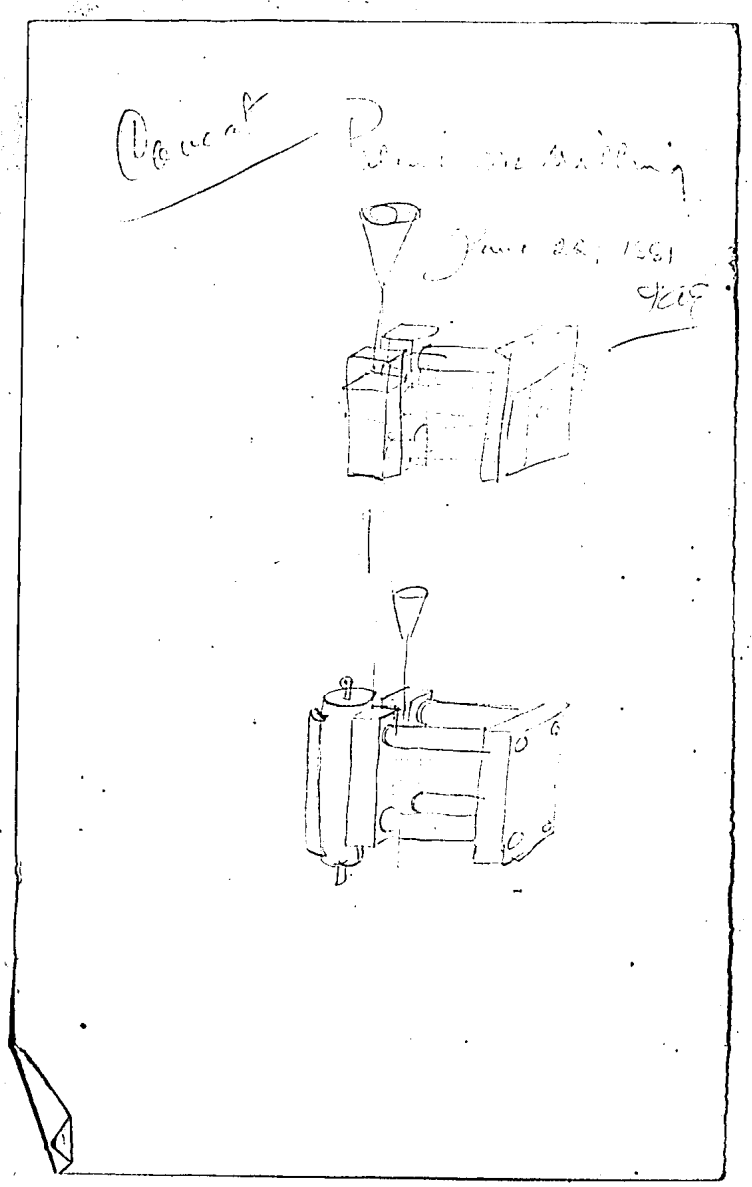
Patent

S. B. Mott

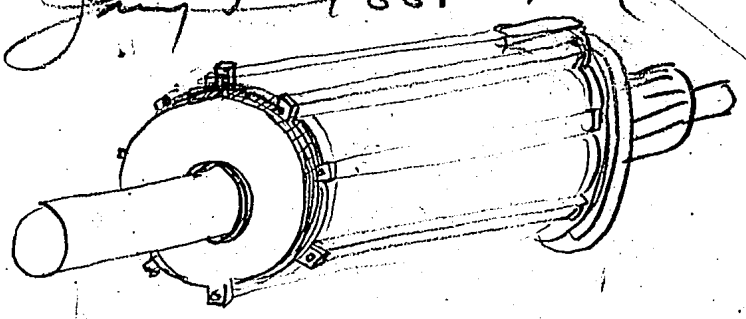
No 1

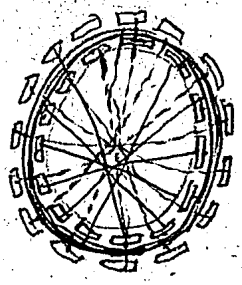

Clitton
S. D. Mott
No 2
Ohio Mich
June 22
1831





Patent
Jany 5 1864





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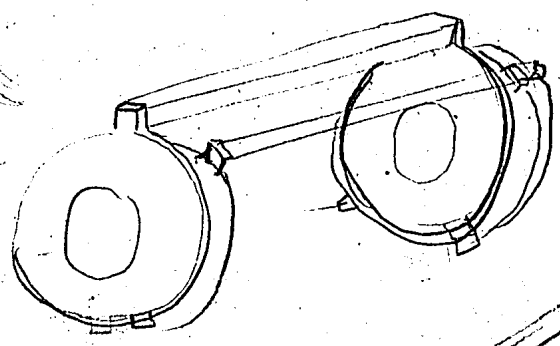

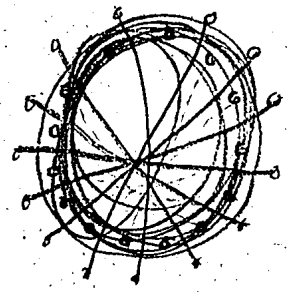

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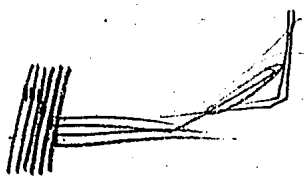
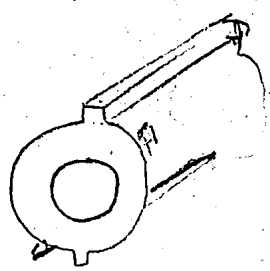
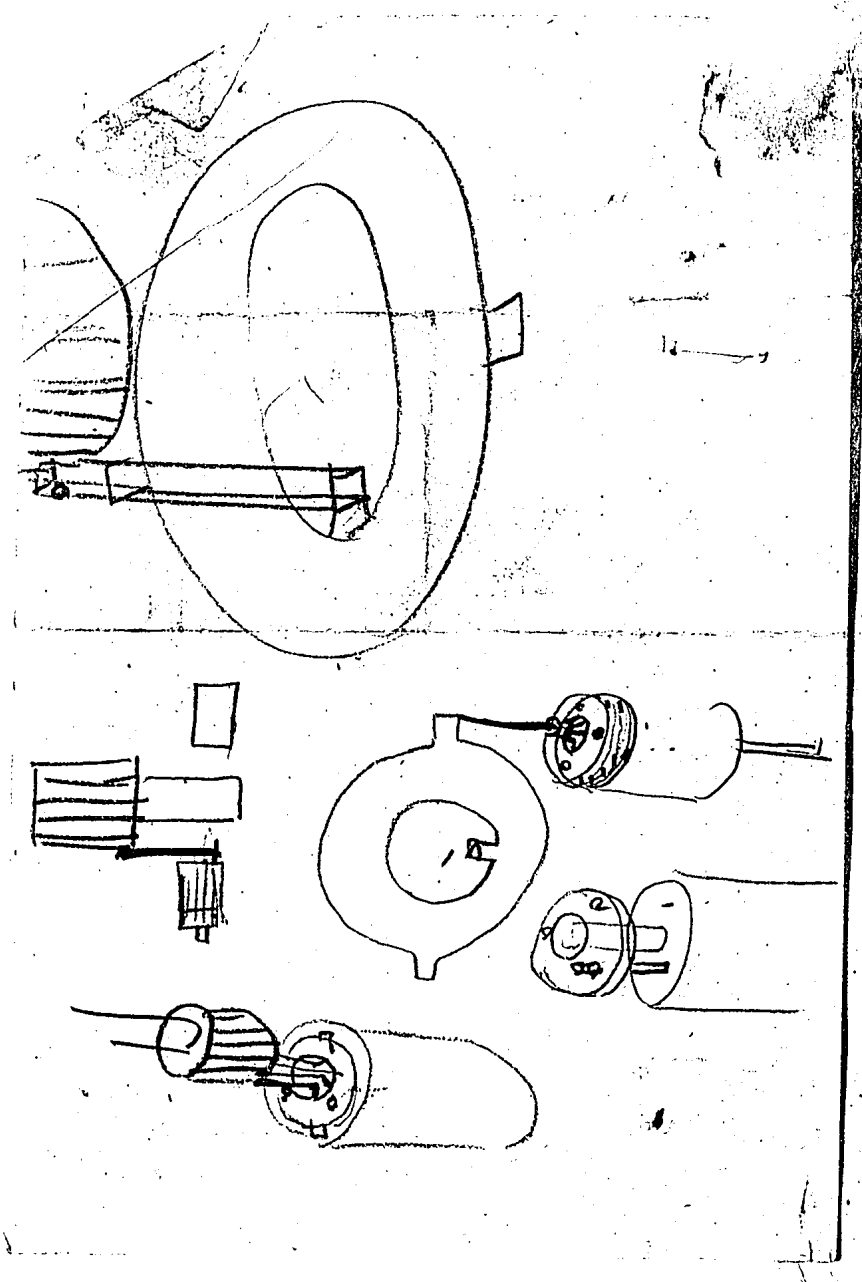


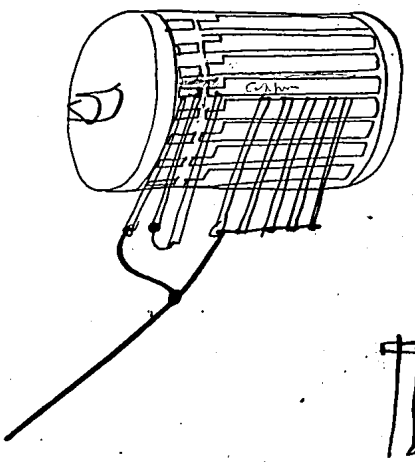


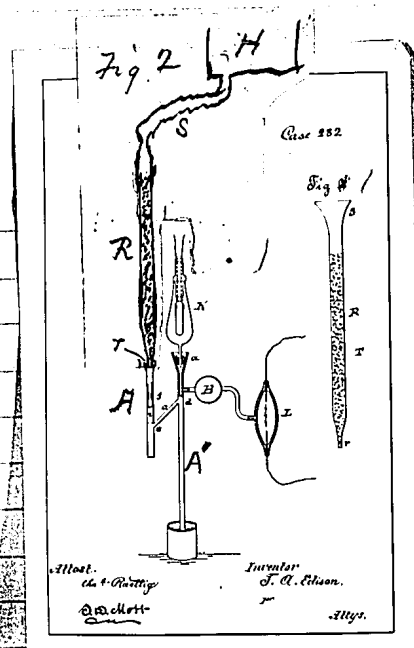


Returned

July 2d 1881

S. D. Mott

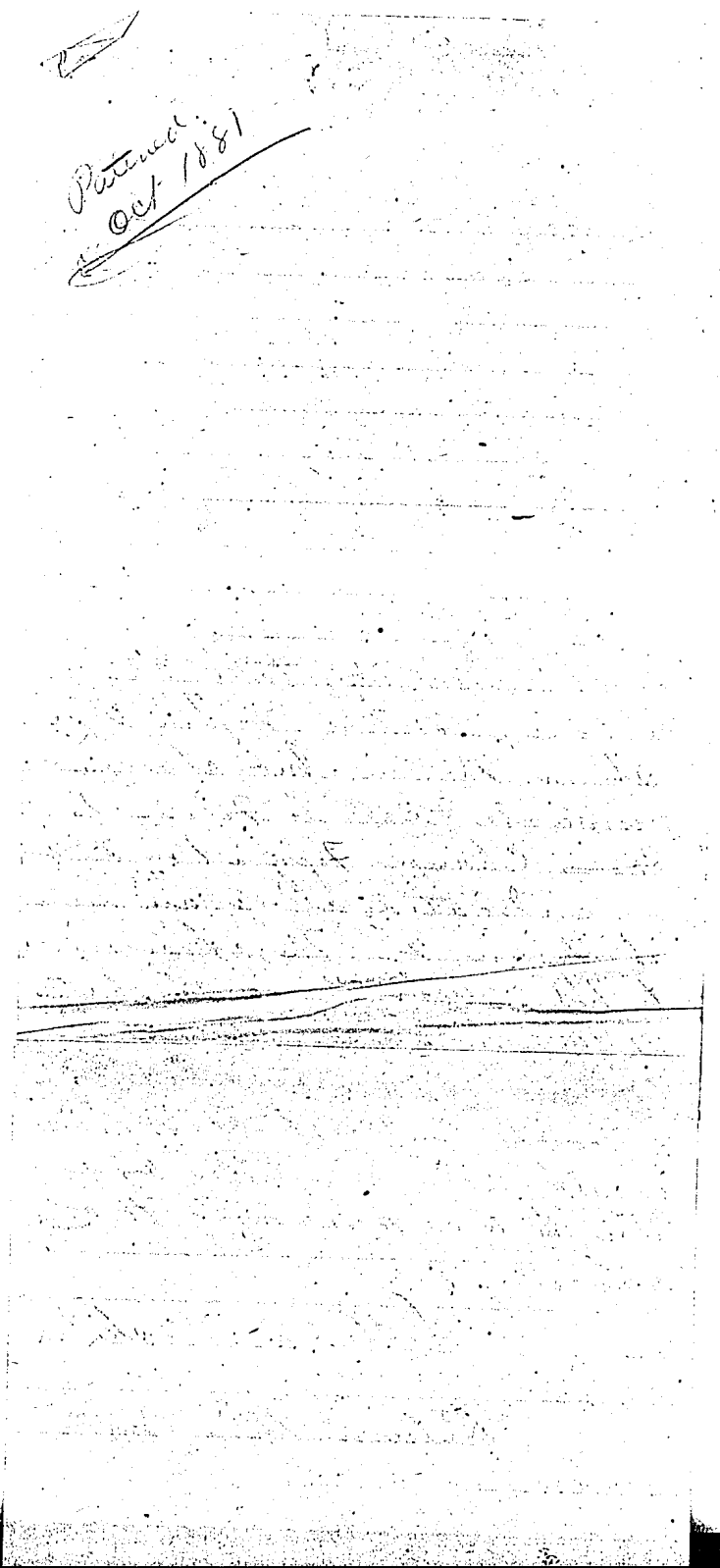





Paul a Jolumn, Take 282 as a base, Make Figure 2 as shown Thereon but change numerals & call it Figure 1. Change Figure 1 in 282 as indicated above and make it Figure 2. The change is to have tube R in the path of the mercury, its small end being in the upper end of first drop tube A while the upper is connected by a tube S to a reservoir H of mercury.

Letter a in circle above.

Return this with Drawing


Patented
Oct 1881

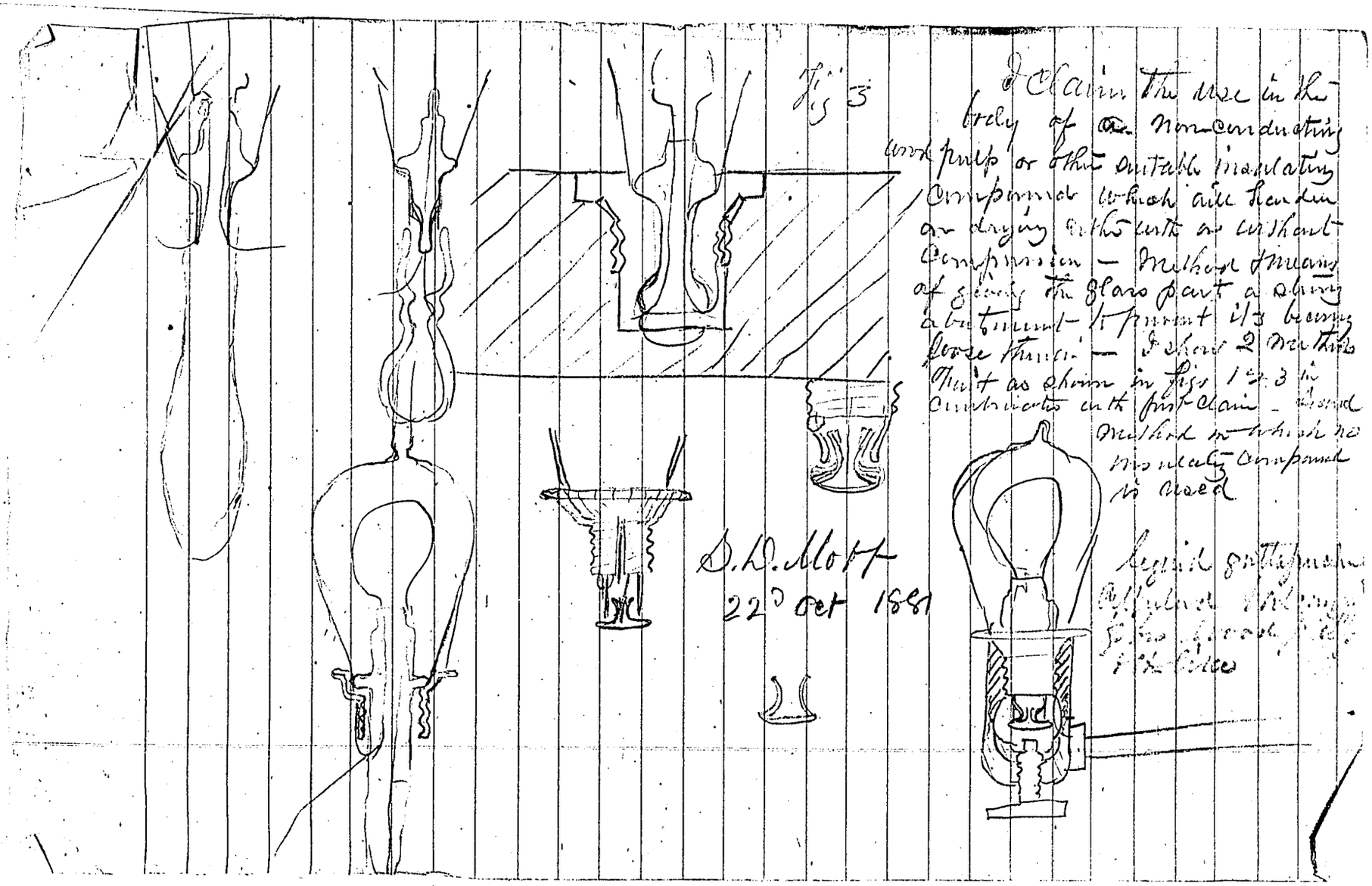


Fig 3

I Claim the use in the body of a Non-conducting wood pulp or other suitable insulating Compound which are heated or drying out so as to exhaust Compression — Method & means of closing the glass part a during a treatment — I prefer 1/3 bearing loose thereon — I show 2 Methods Must as shown in figs 1 & 3 in Combination with first claim — claim Method in which no Moisture Compound is used

S. D. Mott
22d Oct 1881

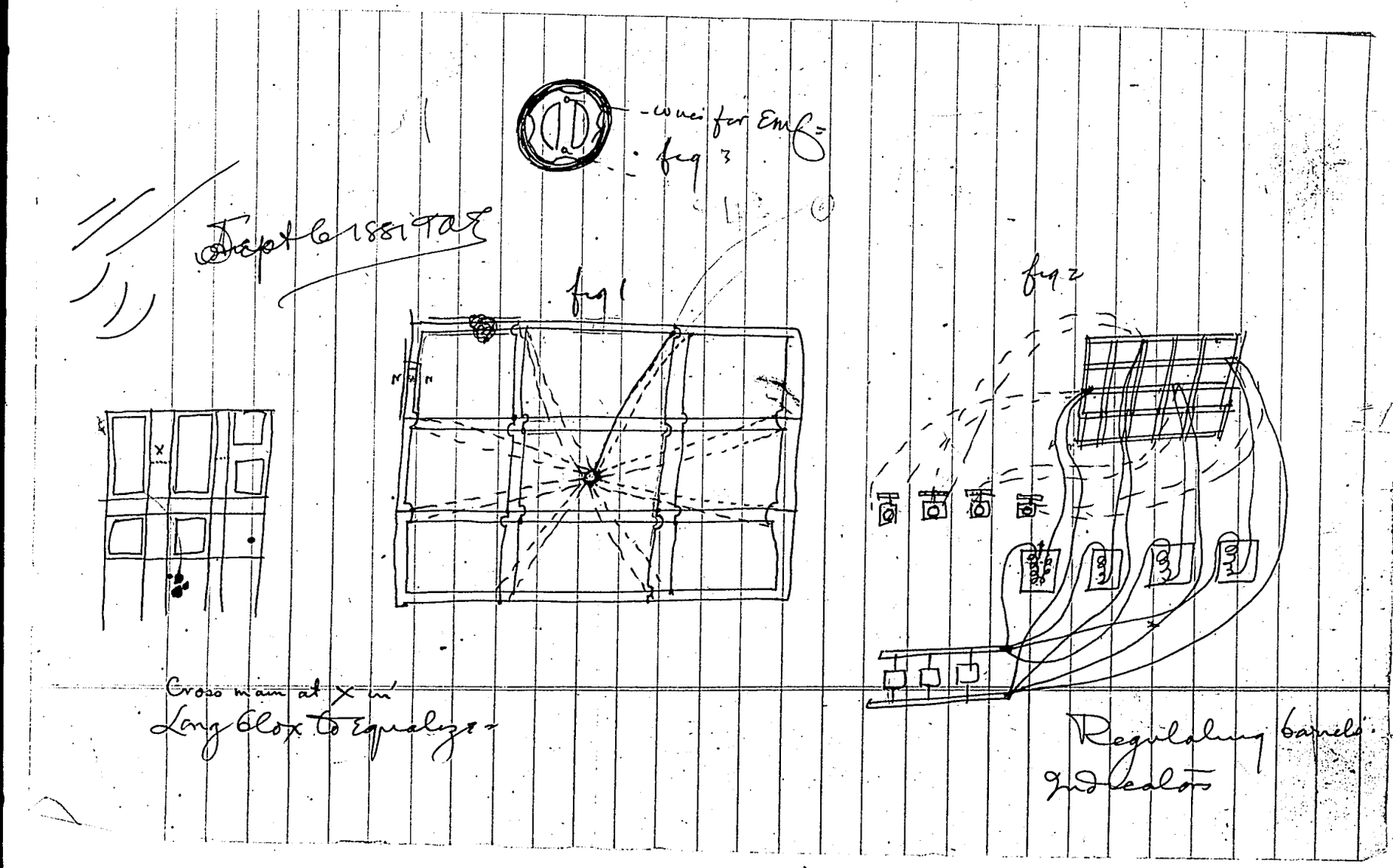
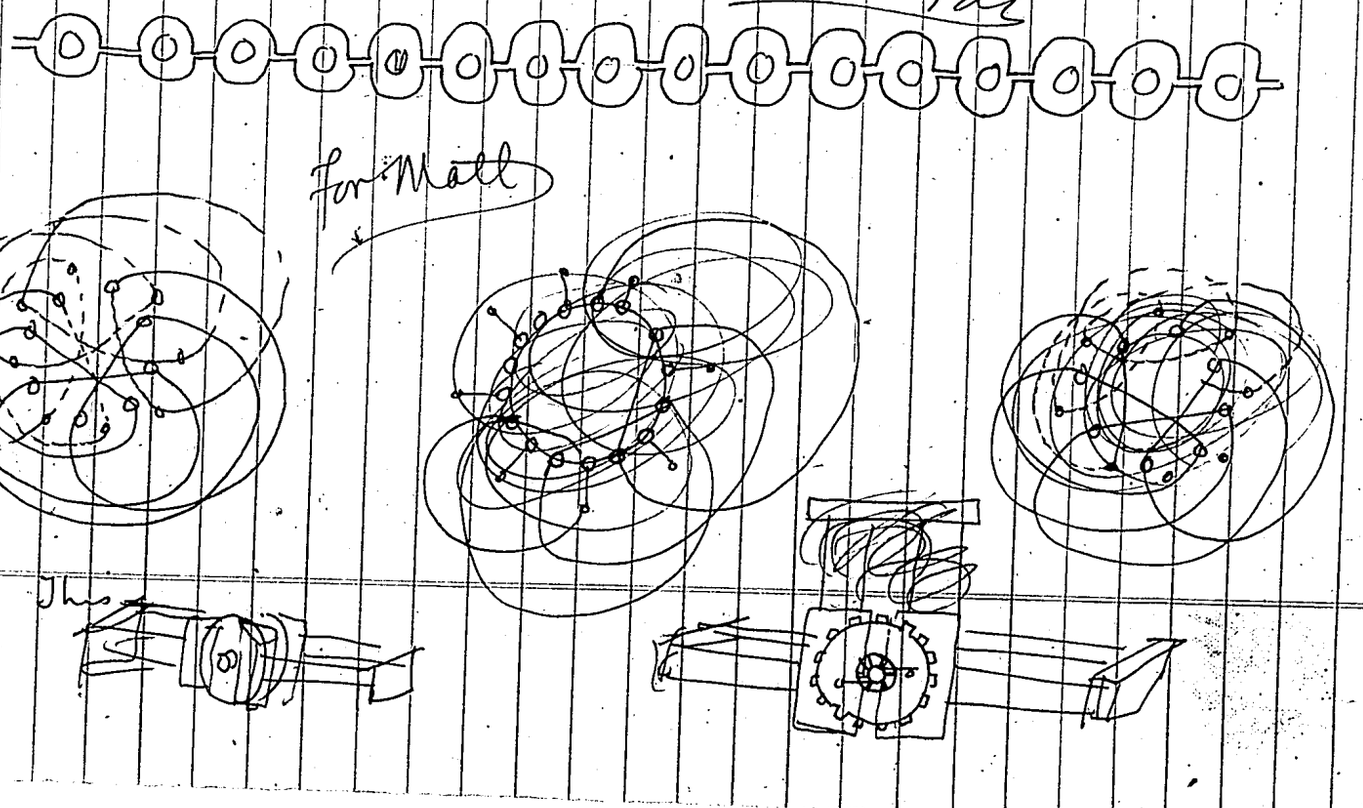
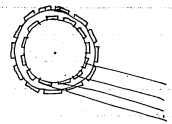

-wave for Emf=
freq 3
freq 1
freq 2
Cross main at X in
Long block to Equalizer
Regulating barrel
and leads

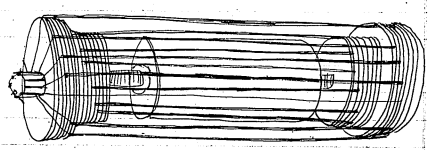
Plate Dynamo Sept 6 1880

Tat



For Matt

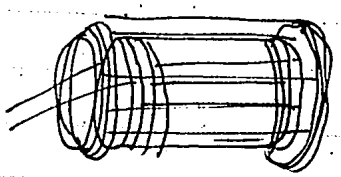


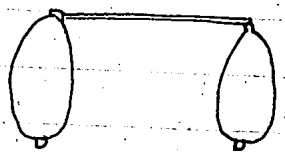


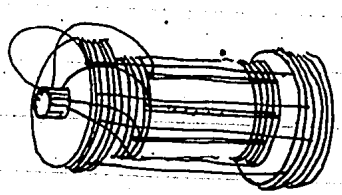
Robbin for Dynamo.-

Mott for Patent,

Sept 10 1881 TAE.







Sept 10 1881

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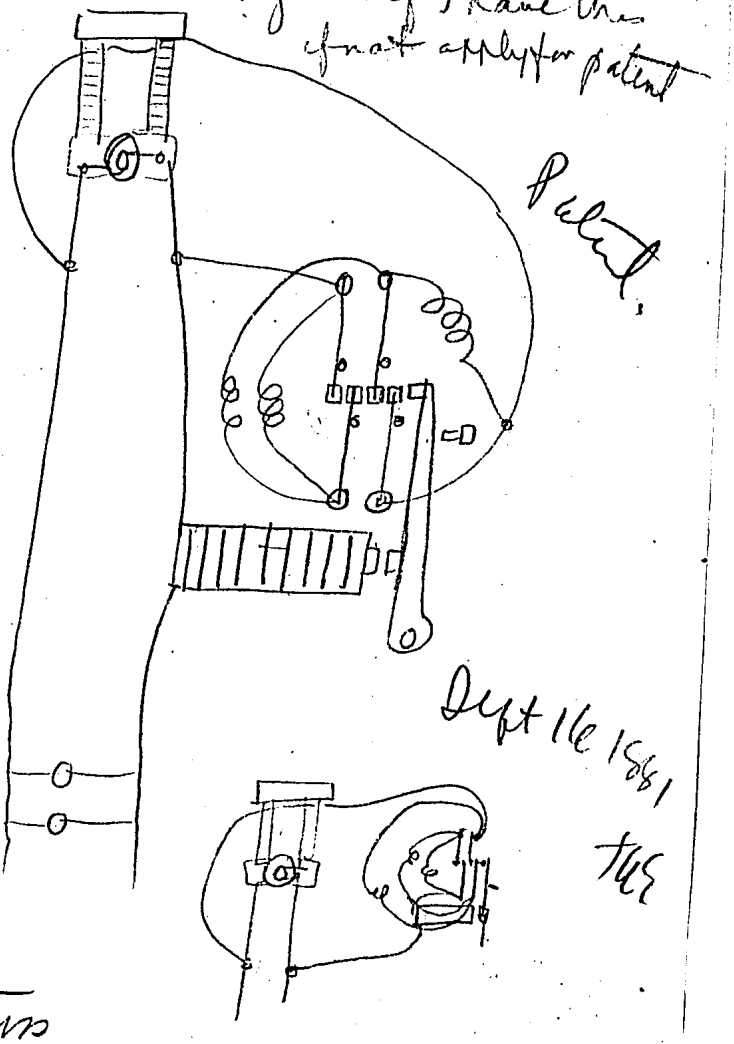
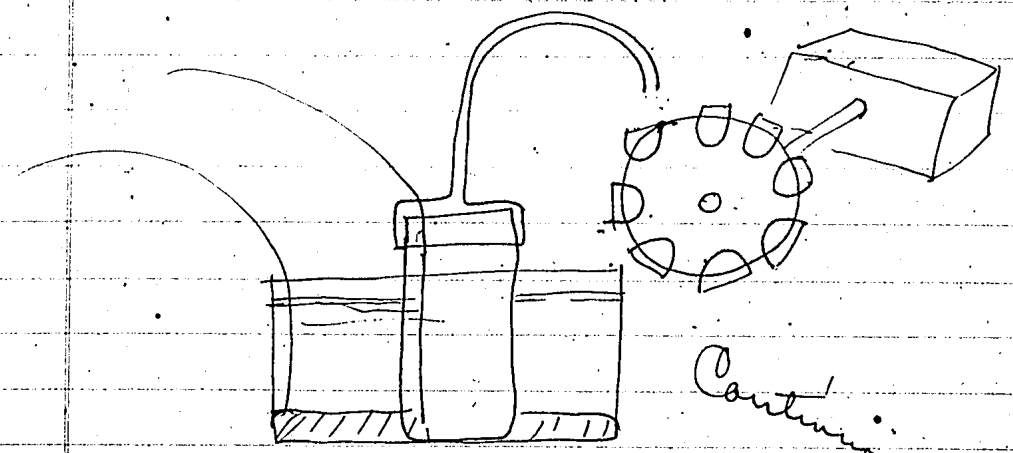
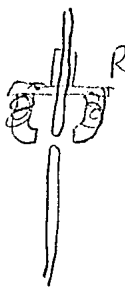

Dyer see if you have other
of not apply for patent
Dept 16 1881
THE
Witness
S. H. Short



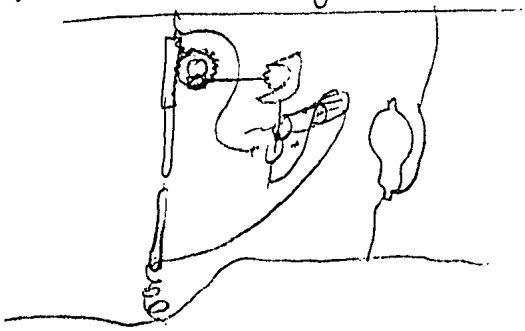

Mercury Melter
Sept 9 1887

Sept 17 1881 T A Edison

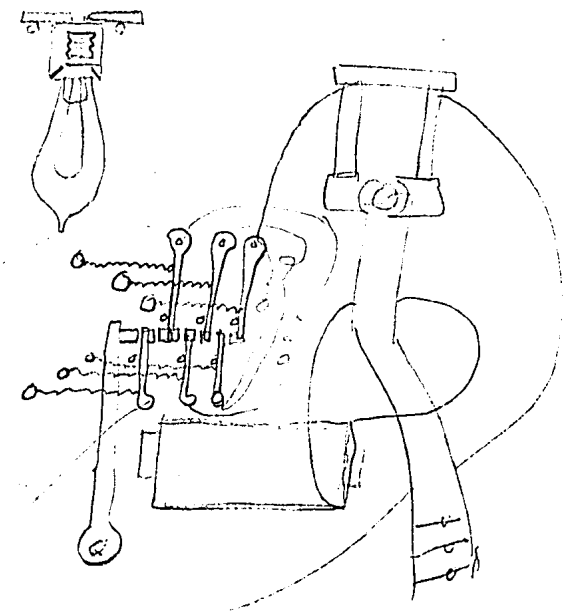


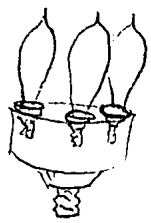
Revolve a magnet around the carbon so that the arc will revolve around the carbon —

Put a lot of regulator lamps with continuous feed in Multiple arc

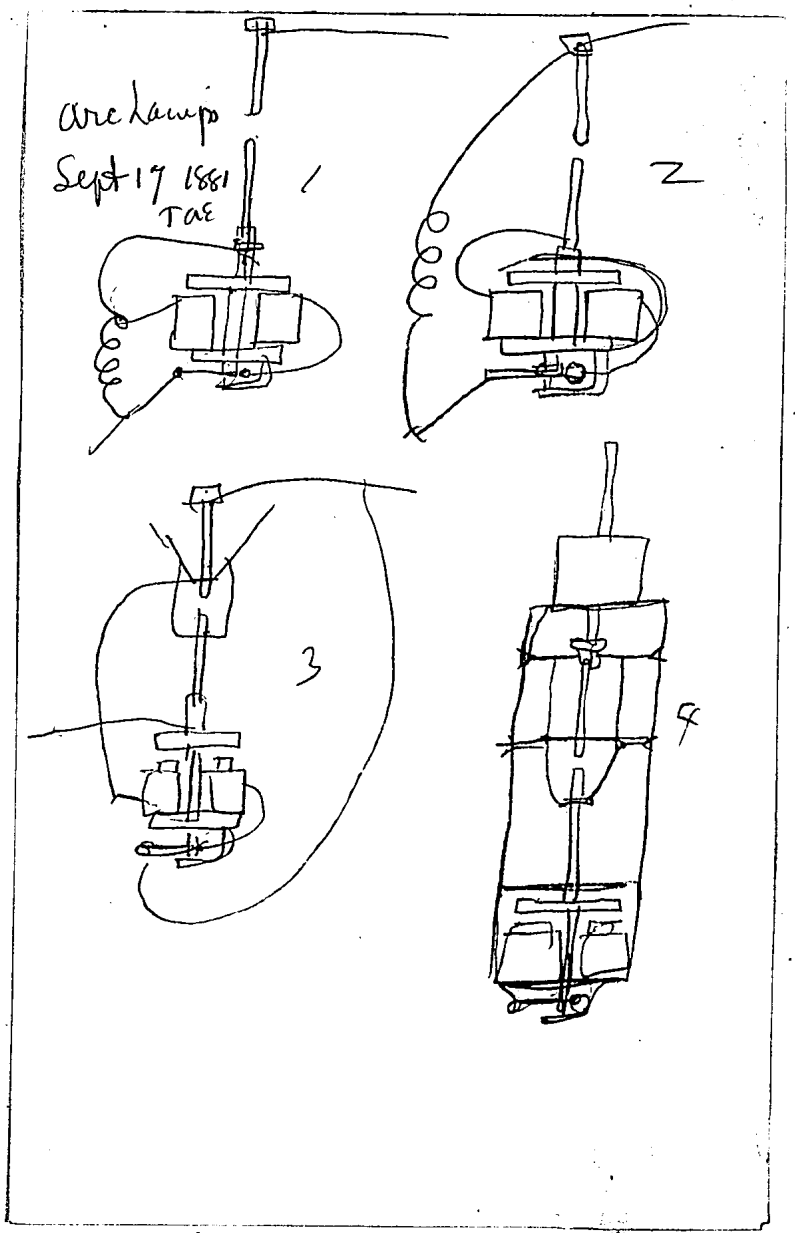


Sept 17 1881 7 pm

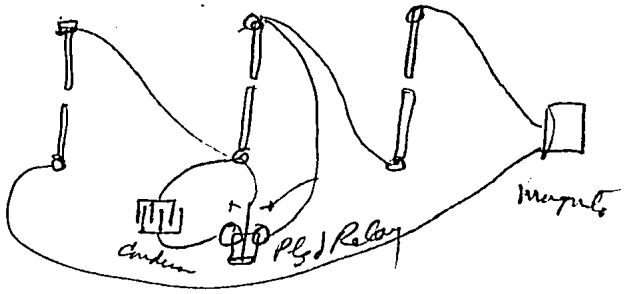


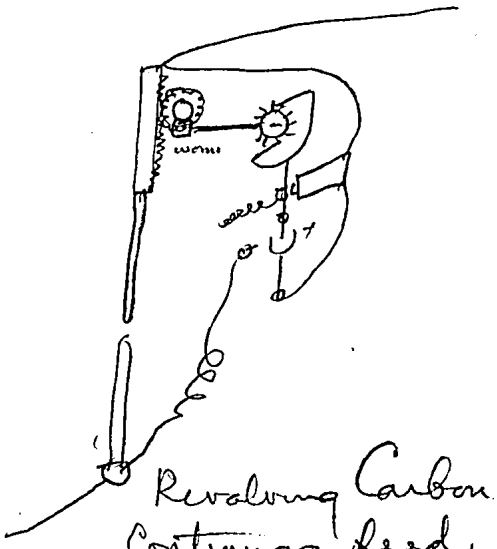


3 socket in Large Socket

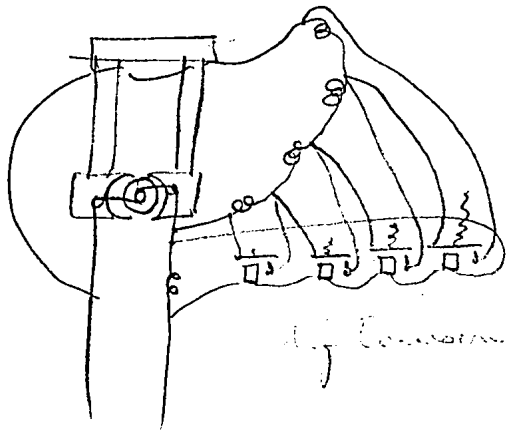

Arc Lamps
Sept 17 1881
TAE
1
2
3
4

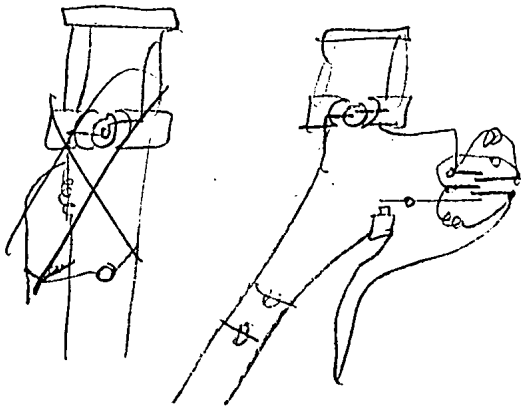
Sept 17 1881 Jablochkoff arc lamps




Revolving Carbon
Continuous feed.



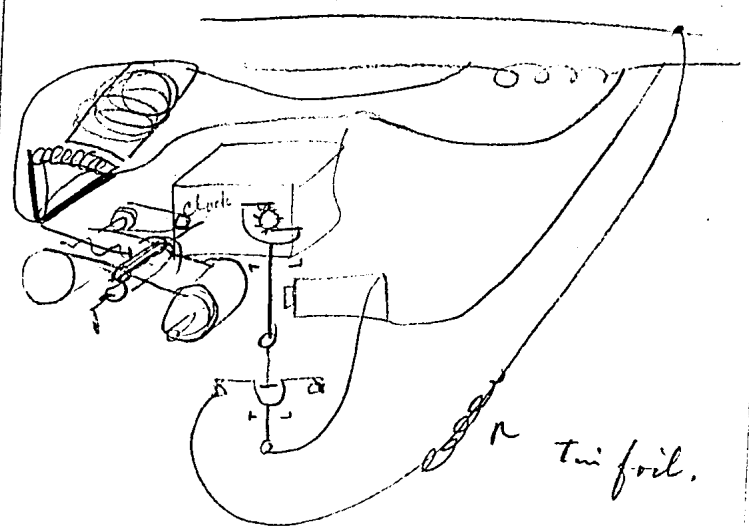


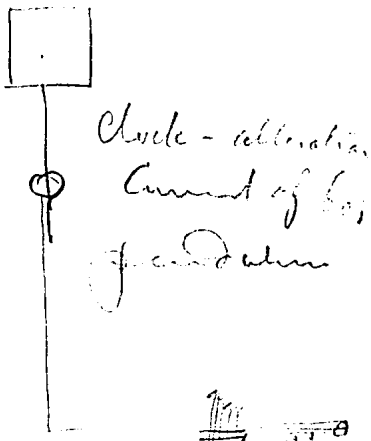
OK

Automatic Regulator

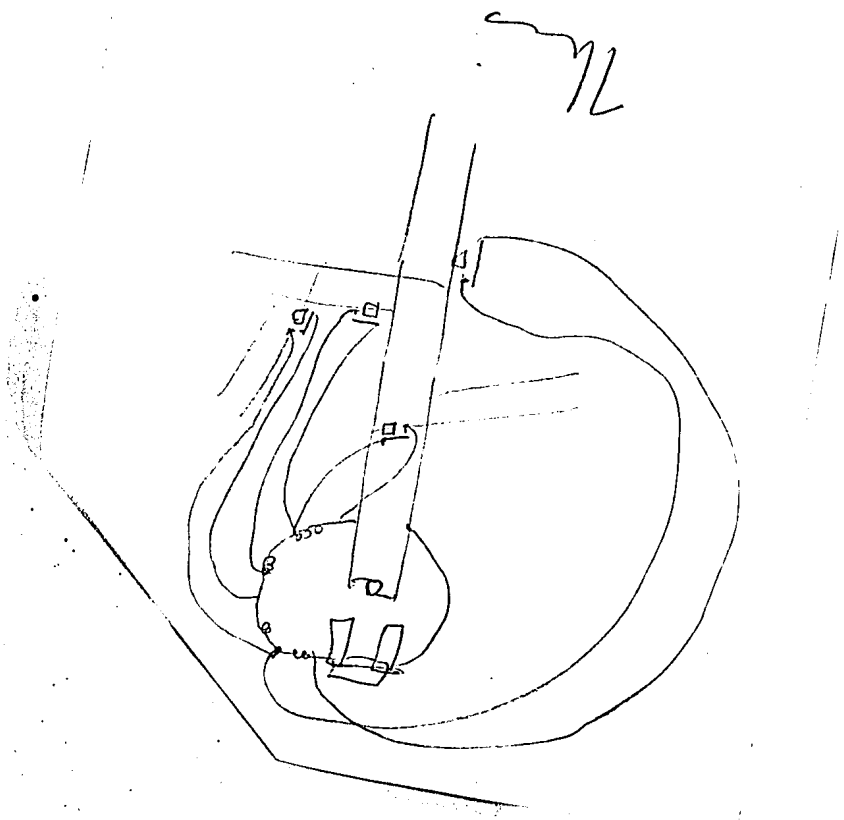
Sept 17 1951 TAE

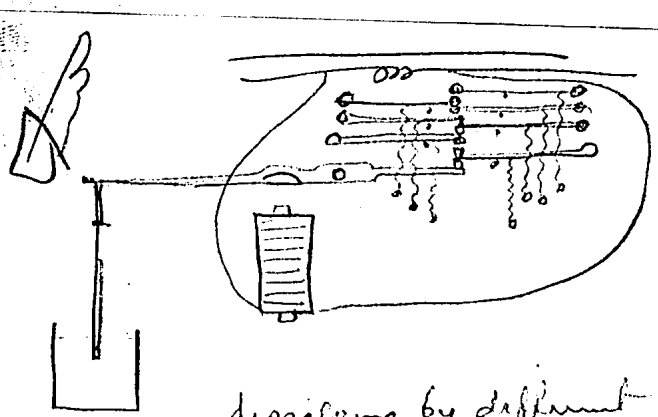
Metn Sept 17/1881 Tel



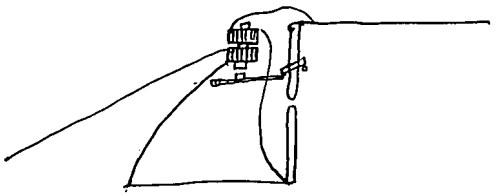




OFFICE OF
Edison Machine Works,
104 Goerck Street,
New York, ..... 188





dissolving by different
immersions – Silver in
Cyanide or Copper in
cyanide of Copper or
[illegible]



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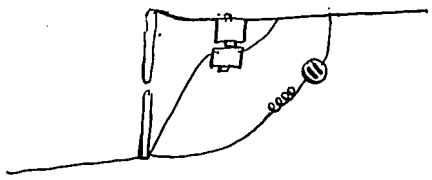

Sept 28 1861

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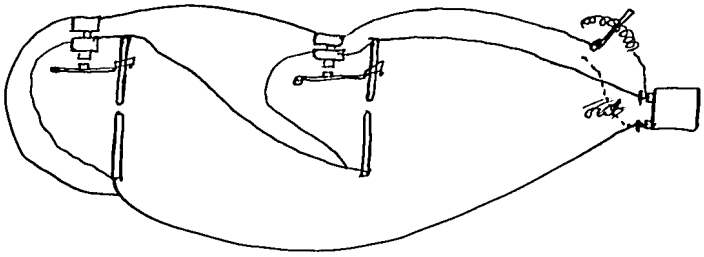
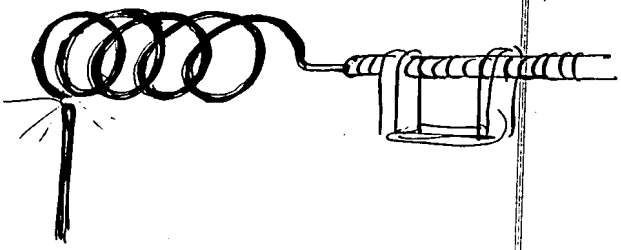
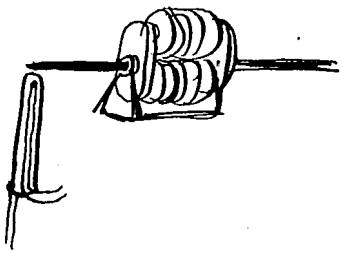
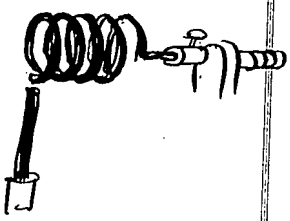
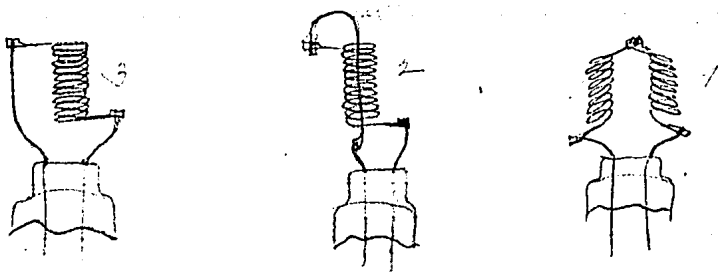




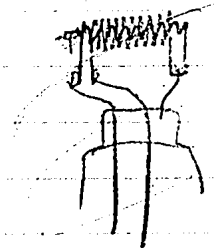


4

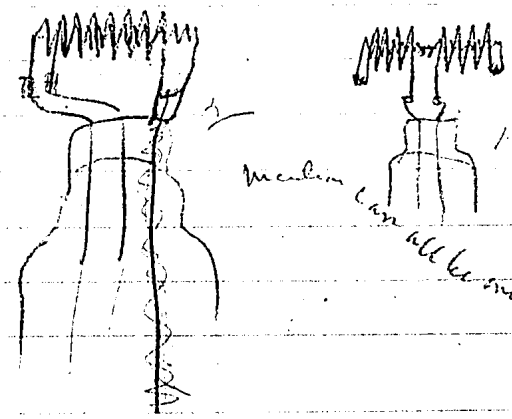


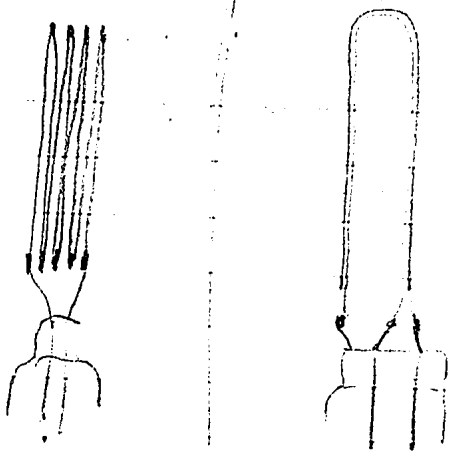



Claim Vertical Coil – Coils arranged to form arch. 2 coils placed together. ~~Coil~~
Coil with conductor of carbon rising through center
A spool formed of wood or woody fiber material with threaded ends. Coils of carbonized thread wound in a spiral form around by placing
~~Above~~

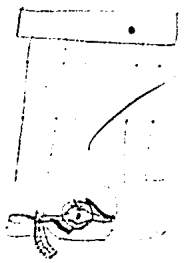


~~Arch~~ of Coil

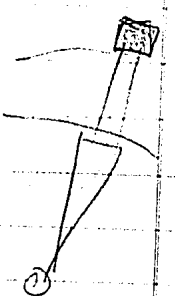


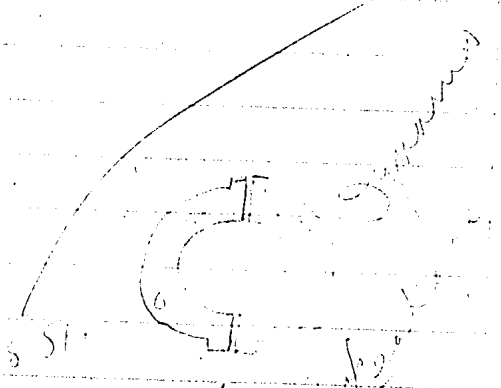


Mercury in this case
that separation produced
by the failure of an earthy
oxide.

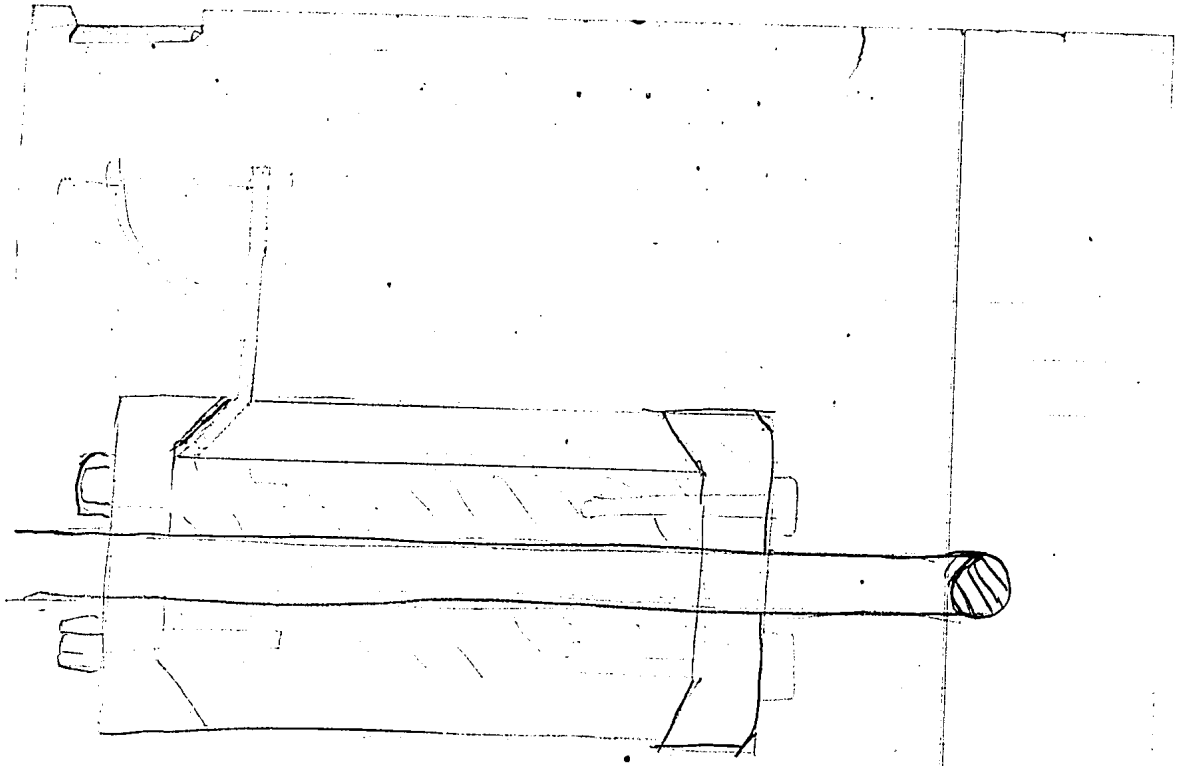


in connection with
indicator of condition
or [illegible]

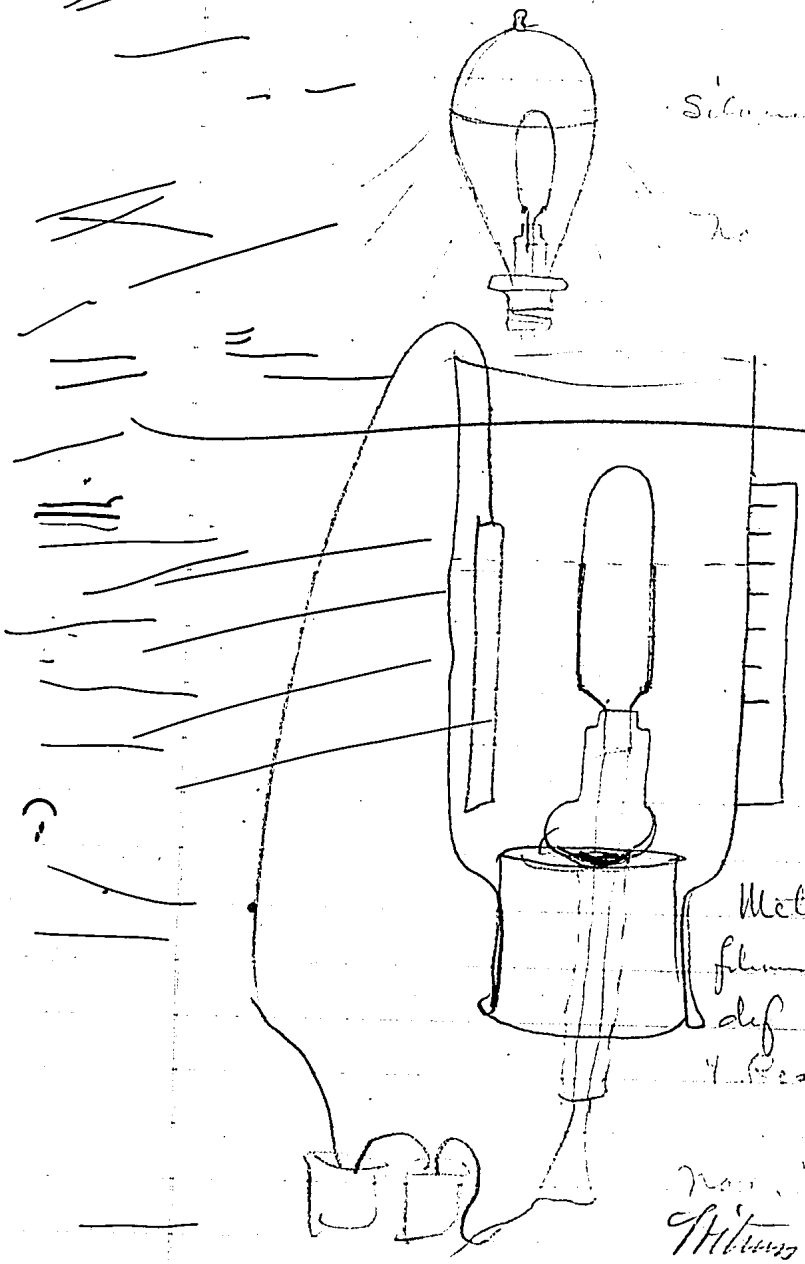




This



Patent.



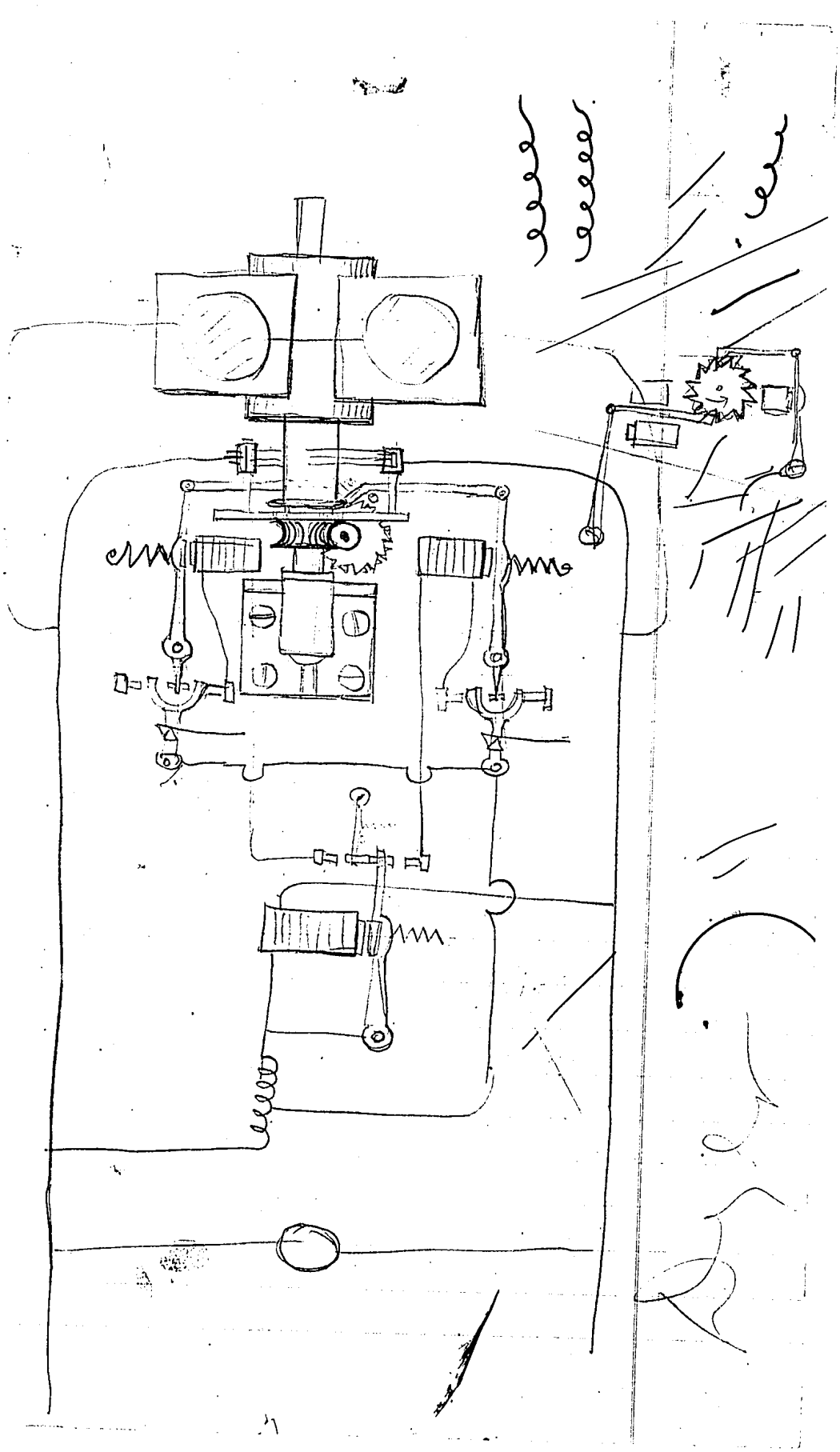
Silvered or ground

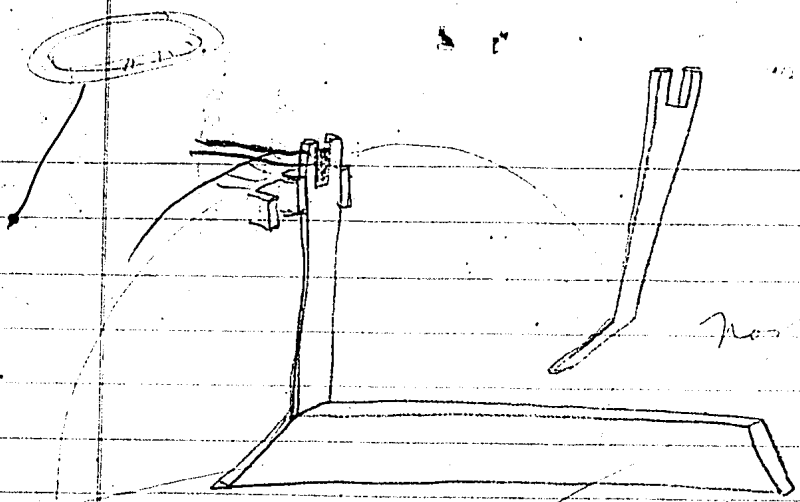
Patent

Method of making filament of Carbon and carbonizing same

Witness

S. D. Mott

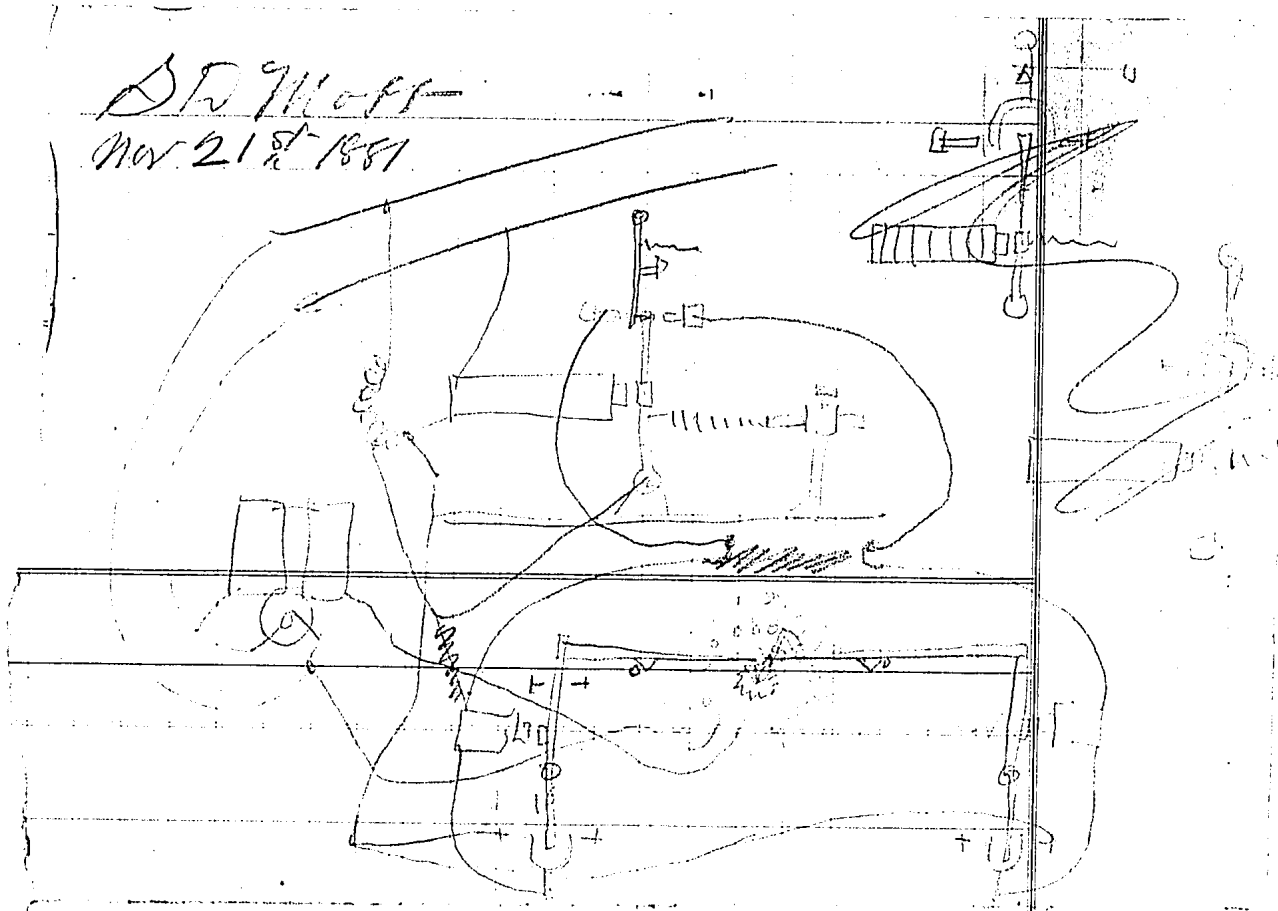




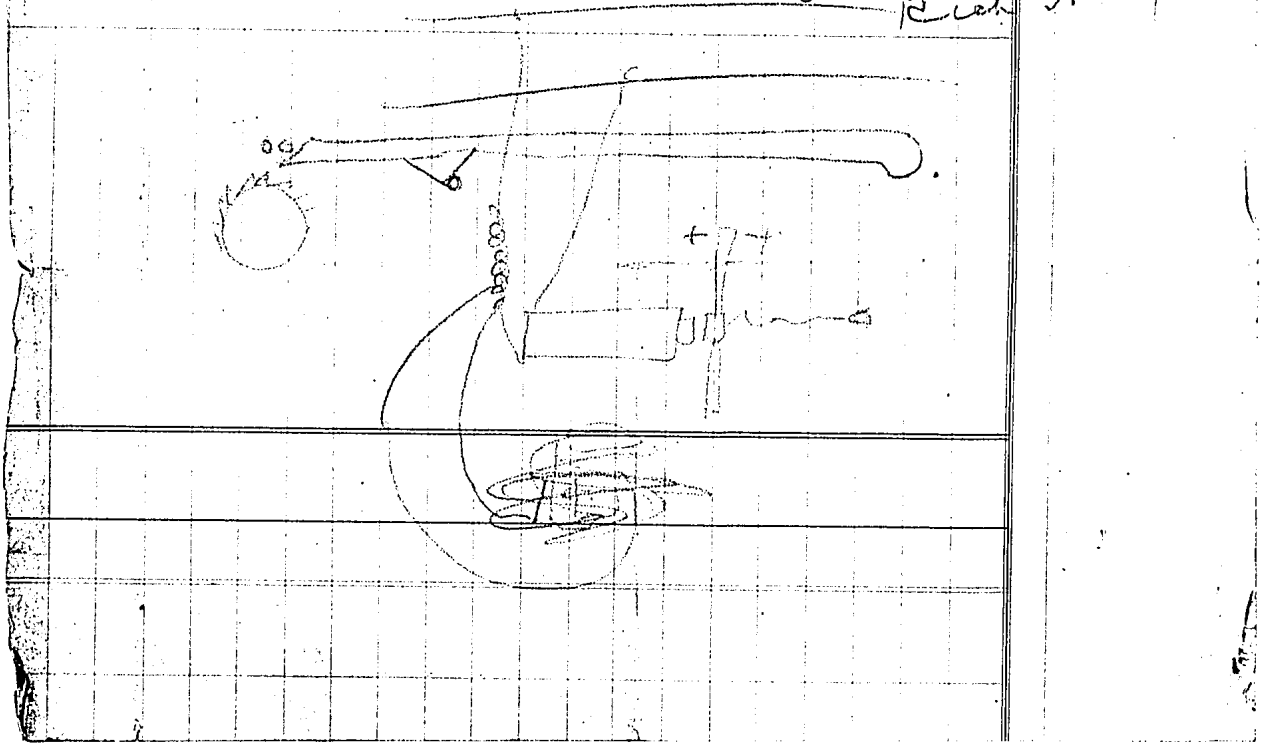
Commutateur 2 dynamo

Dr Miller

Nov 21st 1881

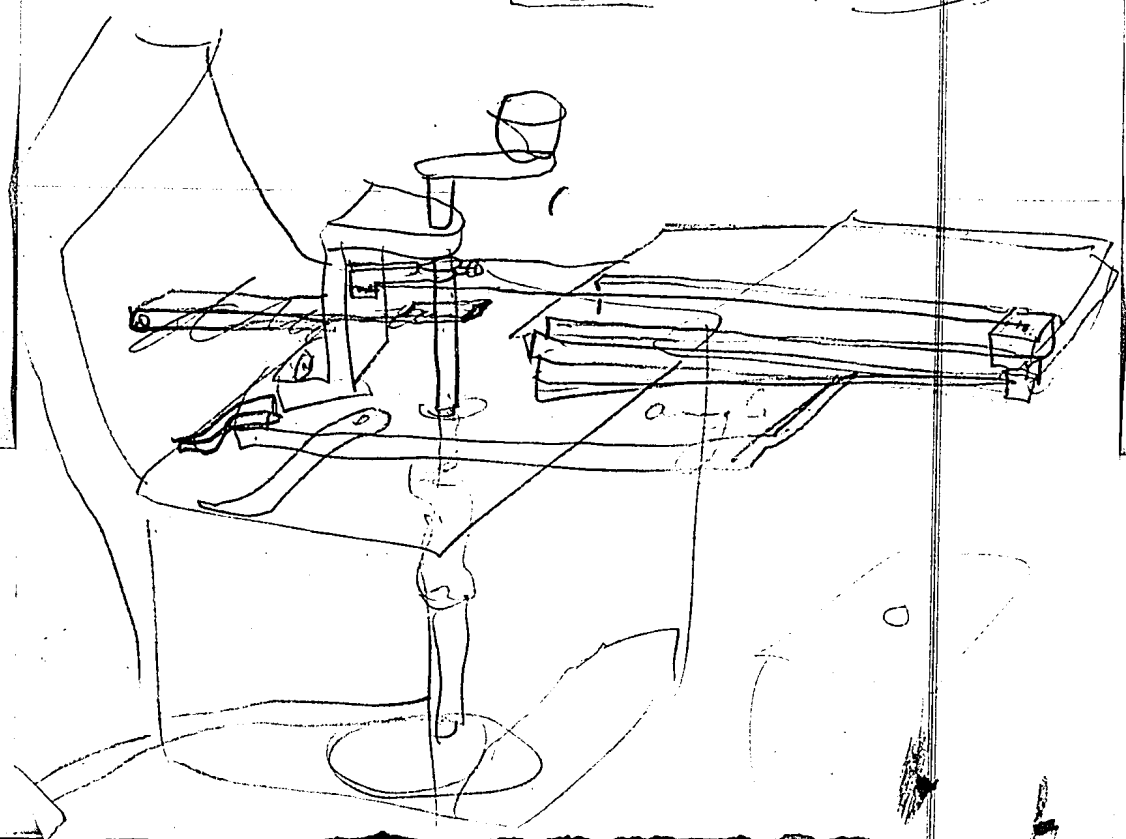


Menlo Park N J.
Nov 20 81
Witness
Richd N. Dyer



Withers

Dec 19 1981



317

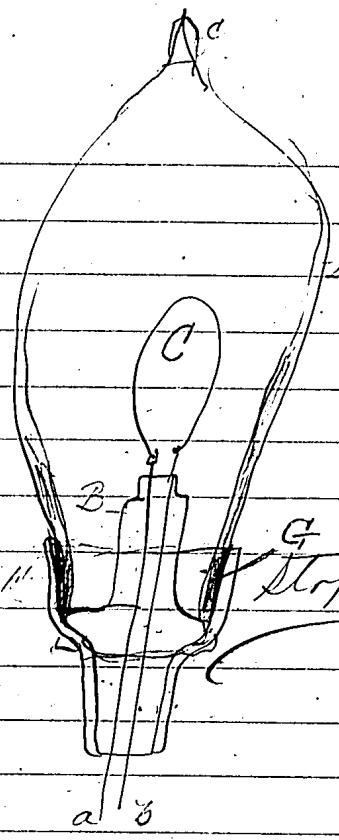


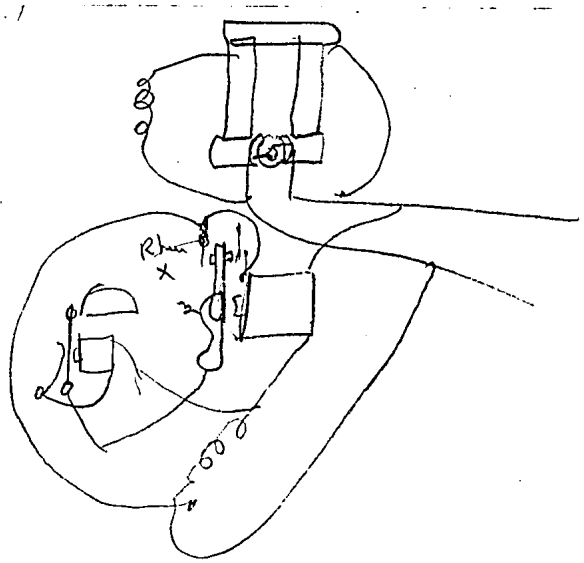

Fig 2

Stopper

Witness

S. D. Mork

A2




R at x to make bell weaken when lights low + ring when lights high -

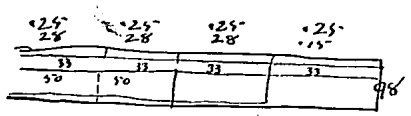
The Edison Electric Light Company,

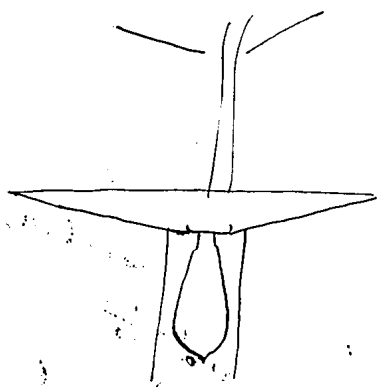
65 Fifth Avenue,

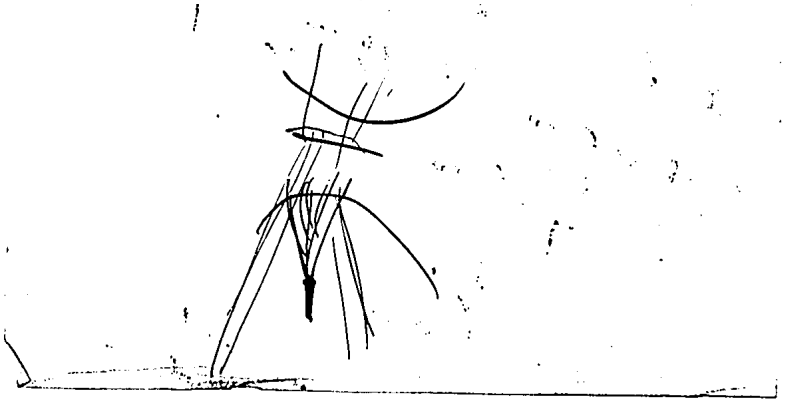
28 / 3 / 84 — 27 / 4 / 8

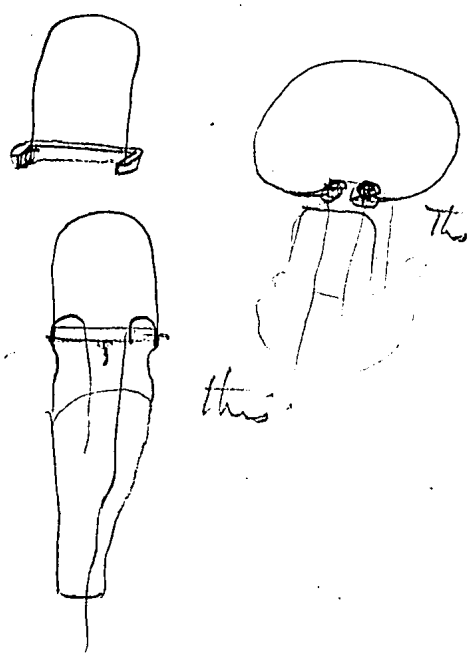


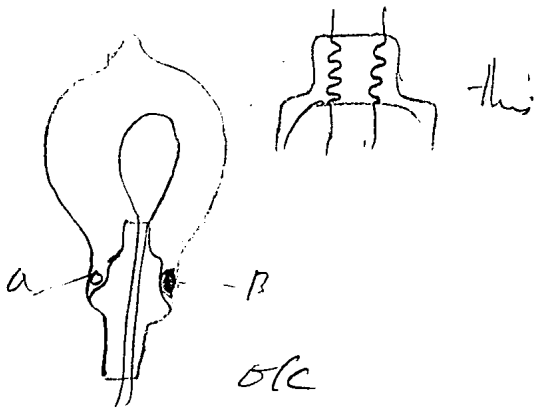
New York,.....188







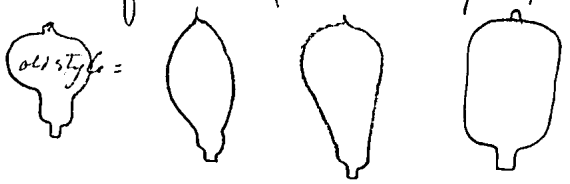




O/C

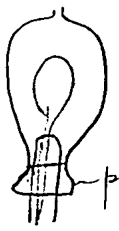
a pumice soaked in Naphthaline,
B Cocoanut charcoal to absorb Hydrogen.

~~Section of Double Exhaust~~

Section of connecting up tube




Claim Nickel ~~plated~~ palladium, gold plated copper or iron wires for sealing in glass =



plaster paris seal. coated with gutta percha -

also cement composed of anhydrous phosphoric acid in fine powder & Caustic Lime, fresh burnt. put in a dry state in layers & moistened at boundaries when another layer

Basic to my thesis,
2183
5879 -
2181
2182
Roughan made glass by fluoric.
also made part pour the Cementin
also glycerine mixed with glue,
Matter Sulphur -
glue water oxide zinc
2204.
2213
2238.
Lawson to Keep on Trying deposit
Silicon also, Zirconium by
Electro Gem - See Gore Phil
magazine -

See if my Electric R.R. has been
in application in office for what
make application = NO = make
drawing
Enter
See about Rowland application
& Cabinet,

Type will scribe for letter
See Walker about circuiting
attention of office about granting
that Dynamo like Brush when
I had application in, also
punching Carbons filaments from
Carbons See my graphite Case -
About preliminary statement
about Edison Johnson Magnet dont
forget old Domestic Magneto box when I had f

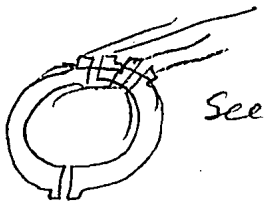
Claim end on brushes Explain why.

ascertain absolutely if Mica insulation is secured in foreign countries.

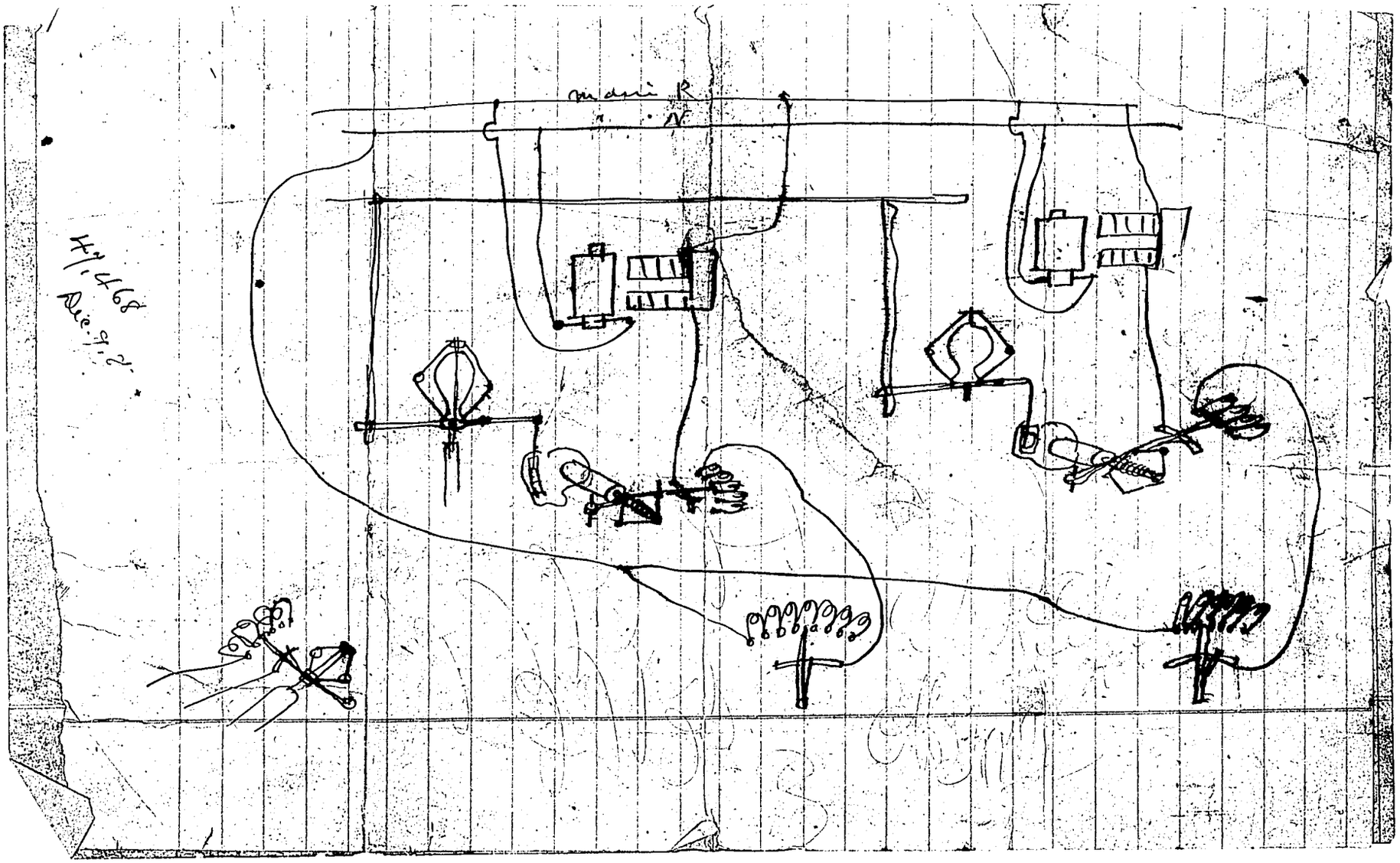
Have Kunzi get Matt Blue print of new Safety Catch box for blade runners.

Use of all organic (10) wood fibre is secured for Carbons

Claim a clamp with carbon in it and use setting screw as a part of a metal, such as plat gold (See Brantley)



See fifth o/c



Claim the methods of increasing the efficiency economy of a dynamo machine by increasing the power of the field magnets (1) use of magnet abnormally large in the present state of the art.

I am not aware of any dynamo machines giving Continuous Currents (with armature entirely wound with wire) where there is a single Electro magnet for a field with polar Extensions nearly Covering the cylinder; (and) I am certain there is none with great length of core. The practice is to use two short field magnets quantitized together which does not increase the length but only size. and I have discovered that instead of (the) following this (now) universal practice, the two fields were arranged so that they were not quantitized but made as one long magnet (and) it would increase the efficiency of the machine as the Extending power of the lines of force increase with the length of the magnet and the quantity or number of lines remain with the weight (of the) hence by reversing the common practice I obtain great extending power of the lines of force by length of magnet + to make up the loss in the number of lines of force by increasing the length I at the same time increase its mass - by this means I have obtained machines giving an efficiency of 96 percent

## Technical Scrapbook, Cat. 1148

This scrapbook covers the period January-December 1882. The entries are by Edison and relate primarily to electric lighting. Included are notes and drawings concerning lamps, generators, meters, regulators, electric power distribution, and other parts of the system. There is also some material pertaining to electric railways and to mining lamps. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney, and to Samuel D. Mott, his patent draftsman. The case number of Edison's patent application has been written on some of the items. Some of the notes and drawings at the beginning of the book were dated by Edison's patent attorney, Henry W. Seeley. These documents bear dates of October or November 1882, the date that Seeley received them from Edison.

Case V-31

Patent

New process for obtaining Electrod suitable for large industrial operations =

I form Electrodes by moulding an oxide of Lead around a lead core and Reduce the oxide of Lead by a reducing agent & heat, to the one, called the Cathode, to form the one of the Electrodes, The other Electrode is subjected to a chemical process whereby the Oxide of Lead is reduced to the higher oxide, When Current flows around the two different Electrodes are placed in a cell Containing $H_2O_4$ acid diluted with $SO_4$ + after the great portion of the peroxide of Lead

has been reduced to Red Lead & the metallic lead of the other plate oxidized. The plates are taken from the cell & the one which is oxidized is dried & reduced to metallic lead again by heat & a reducing agent while the other is again peroxidized —

The peroxidation of one of the Electrodes is obtained by acting on it with Chlorine in an Lead chloride Solution, the lower oxide being raised by the action of the Chlorine to peroxide of Lead

N.Y. Dec. 11, '82
W. W. Seely.

Please make this memorandum a part of your Register of Invention Index

Patent,

Improvements in plante Accumulators.

I make the plate by moulding an oxide of Lead preferably Litharge ~~account~~ which is to be mixed with water or gum water around a Sheet of Lead having a roughened surface & having Projections & containing many perforations. The whole when dried is placed by great pressure in a powerful press, the plates or plates are then placed in a chamber or tube and a reducing gas such as Hydrogen, Coal gas or other gas passed through the chamber; heat is then Externally applied and the whole of the oxide is reduced to metallic Lead which being very porous

an internal gives a greater capacity for economy per lb of Lead than Case should be taken that the Compounder should not be allowed Breach as point when the Lead becomes liquid but just sufficient to produce perfect reduction to the metallic state. If greater porosity is required an Earthy oxide may be mixed & moulded with the oxide of Lead the Lead being reduced the Earthy oxide dissolved out as a saleable salt by Acid =

New York Dec. 4, '82

N. W. Seely

A Ballmade with the ... should not be charged to a ... and when the value of the ... is connected Electrically with the oxide - the central web of lead is not essential but it forms practical breaking Claim, the formation of Electrides for Secondary Batteries Consisting in Moulding ... Salt of Lead ... the form desired & then Chemically reducing the Lead to the metallic state for ... etc - Central Webb to make moulded Card, Integral Etc Etc

Patent ... Case 029

Improvement Consists in providing a coating to the filaments of Carbon which when with difficulty oxidizes & substantially Electrical Conveying -

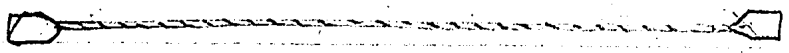
I accomplish this by first Exhausting the globe Containing the filaments of Carbon & then causing a volatile Salt of Silicon to pass into the globe such as Chloride of Silicon, the filaments being brought to incandescence by the Electric Current when the decomposition of the gaseous Chloride of Silicon takes place the Silicon is deposited upon the Carbon giving it a

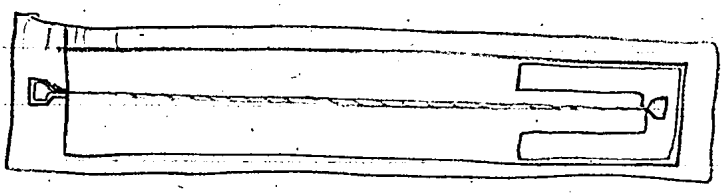
Surface like Silicon

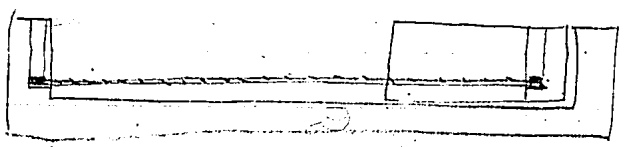
Claim
Coating a filament of
Carbon with Metallic Silicon
in the manner & for the
purpose My Declaration
W. W. Shelley

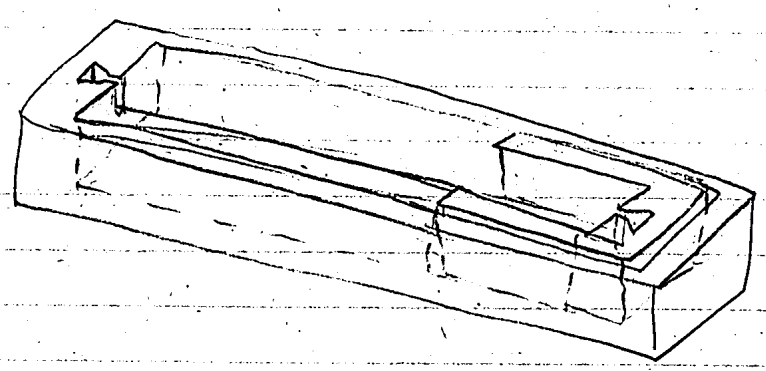
Does reflect light & will
not conduct electricity. Resists
electrical current better than
carbon. Vacuum pump or inert
gas not absolutely necessary, filament
oxidizes.

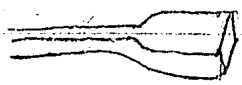
add to violet fuel
case. Mounted for tab
contraction.

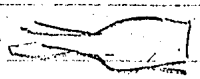












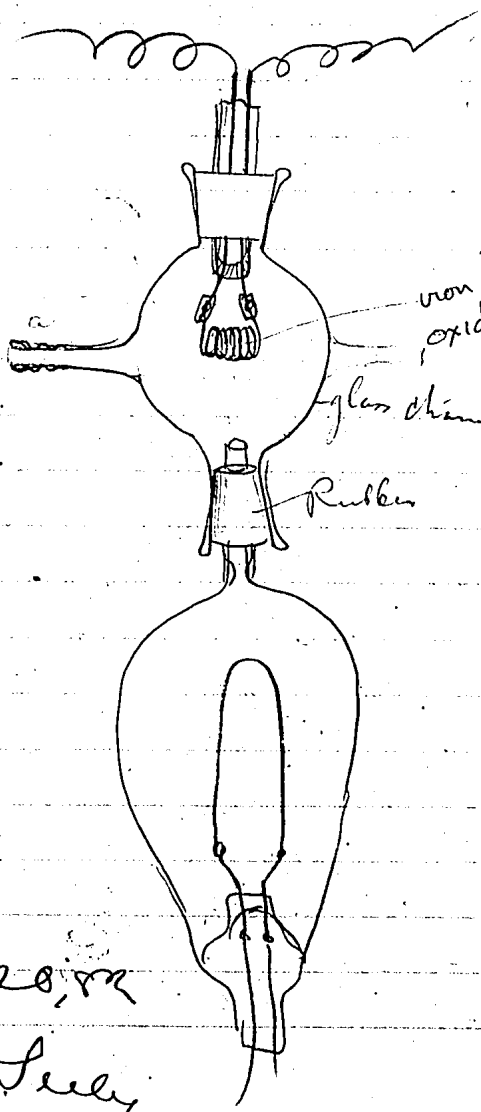
M.M. Lesley

M.M. 23 Sept

exhausted with hand pump at a. Then heat wire, which absorbs O by oxidation leaving N at pressure needed.

Organisms introduced by separate tube. Carbon inlet for CO2. Cotton between bulb + outlet tube.

If carbon used with air carbonic acid would be formed, which would be absorbed by KOH.




Organisms placed in sterile culture medium in bulb

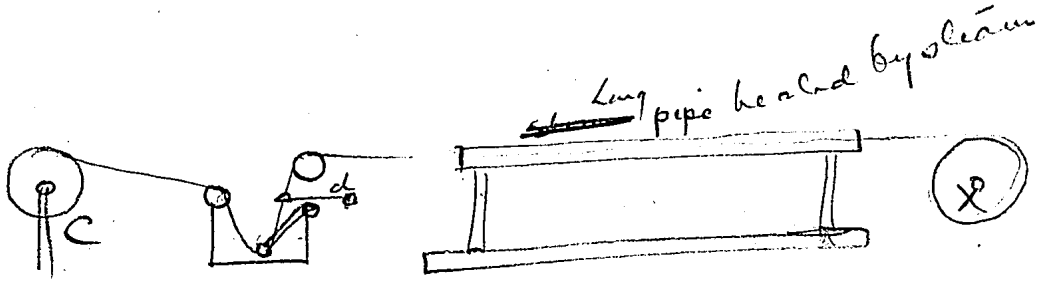
N.Y. Nov. 20, 22

V K Wesley

I take calico covered wire and pass it through a bath of baking Japan Varnish & afterwards bake the wire by heat, for several hours afterwards the same operation is twice or more times repeated until the surface of the wire is smooth & highly reflective of light. If any heavy incrustation is required I coat the wire with calico paper or other fibrous material

passe the coated wire through the bath of japan varnish afterwards baking the same, & repeat this operation until the glossy surface appears. Then Cover this with paper Cotton or other material & repeat the operation of Varnishing & baking Thus I am enabled to put away heavy Coatings of a very high & tenacious Electro resistance material which will permit of rough Handling

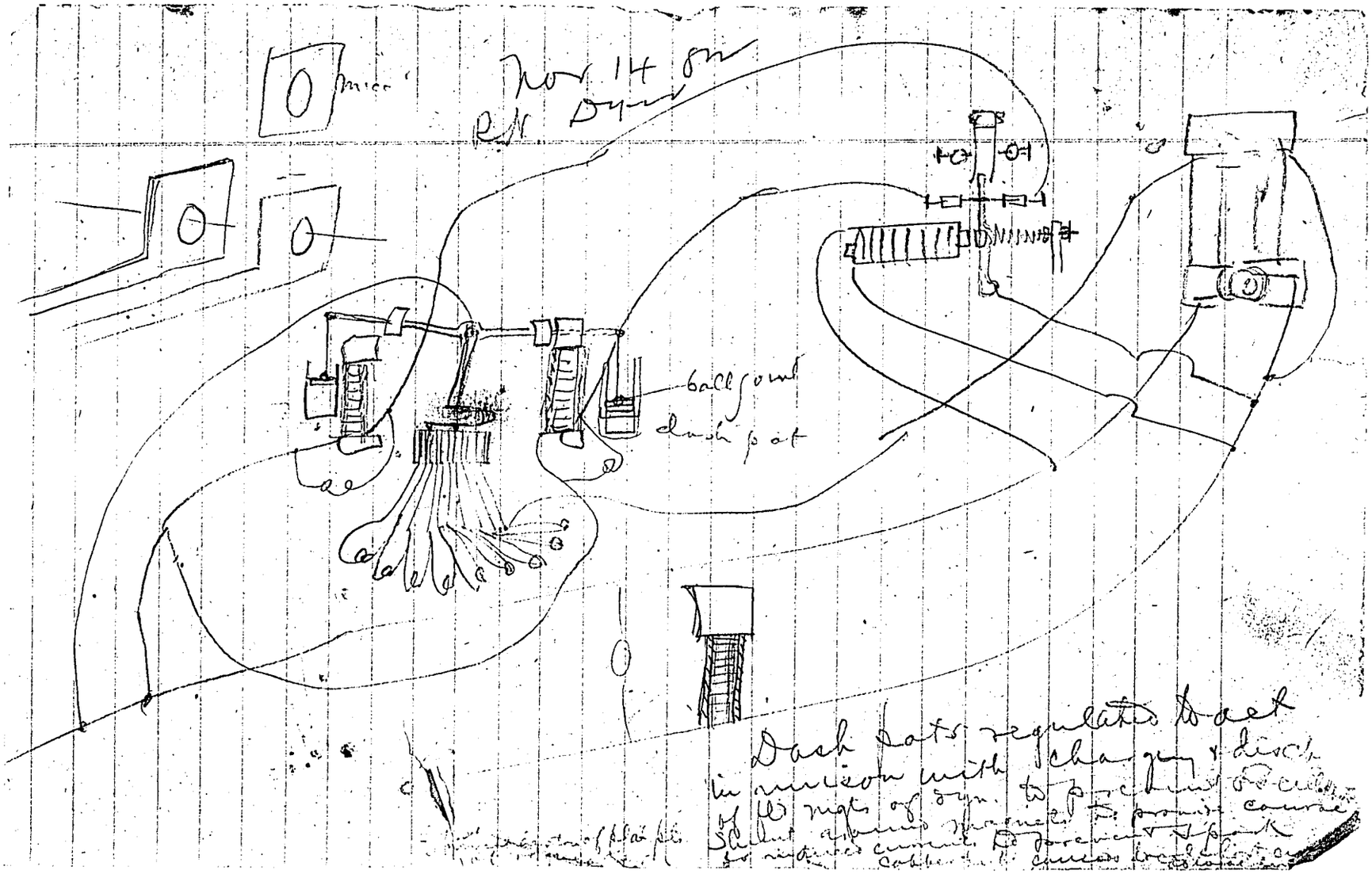
The wire so coated is very useful in winding the rotating bobbin of dynamo electric machines, as the mentalic is very high and it stands very high temperature without softening. it also radiates heat with great facility being black,

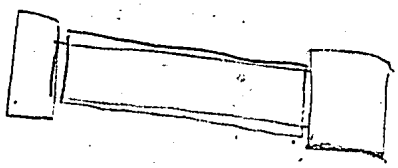


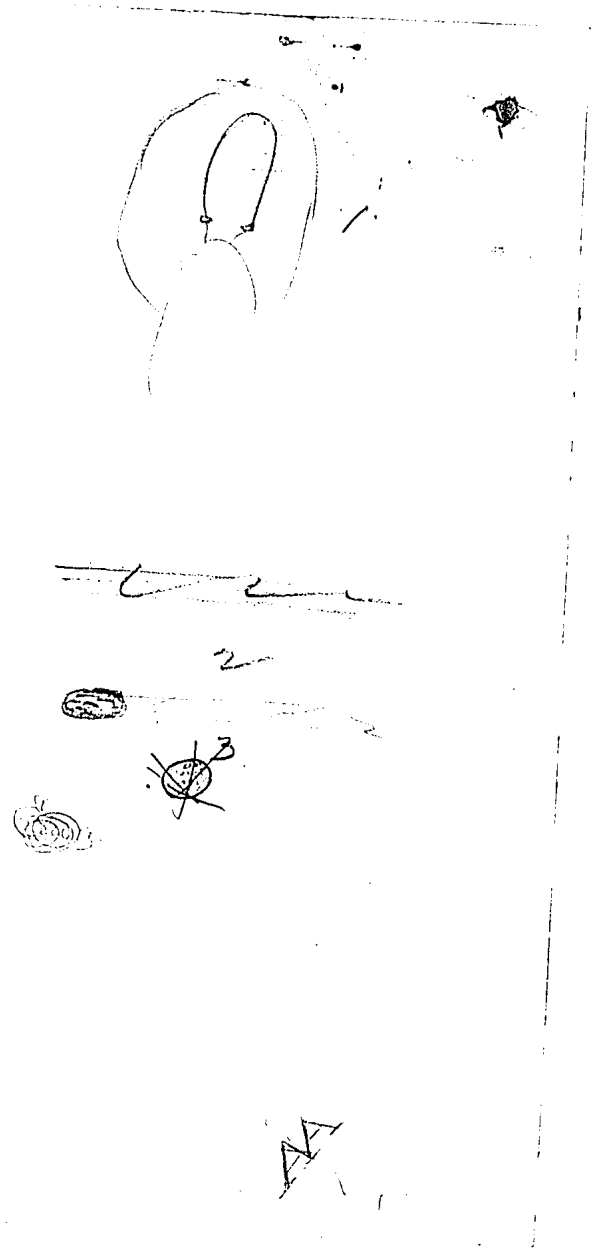

Wire passes through the hollow pipe which is heated by steam - and dries sufficiently to permit the long wound on the reel X without sticking. B is the bath - C the coil of wire & the stopper to cut off

The surplus varnish -

Newcastle Quay 7th, 1882.
W. Swinburne


Mic
Nov 14 50
ball sound
dash pot





Patent.

I take several long thin fibres such as Ramie twist them together to form a thread and secure their ends by a plastic compound of Carbon + Sugar or Hydrocarbon + Carbonize the filament under strain or pressure or bath. —

This produces a filament consisting of a great number of ~~separate~~ individual but continuous fibres and gives a very elastic + even filament

Claim 1st A flexible filament for Carbonization formed of a number of continuous fibres.

2nd A flexible filament of Carbon formed of a number of continuous fibres.

3rd Fastening the ends of such an aggregate filament by a plastic Carbonizable Compound.

4th A flexible filament of Carbon for incandescent lights formed of a number of continuous fibres placed in a ~~glass chamber~~ made Exhausted of Air from which the air has been Exhausted Etc.

"

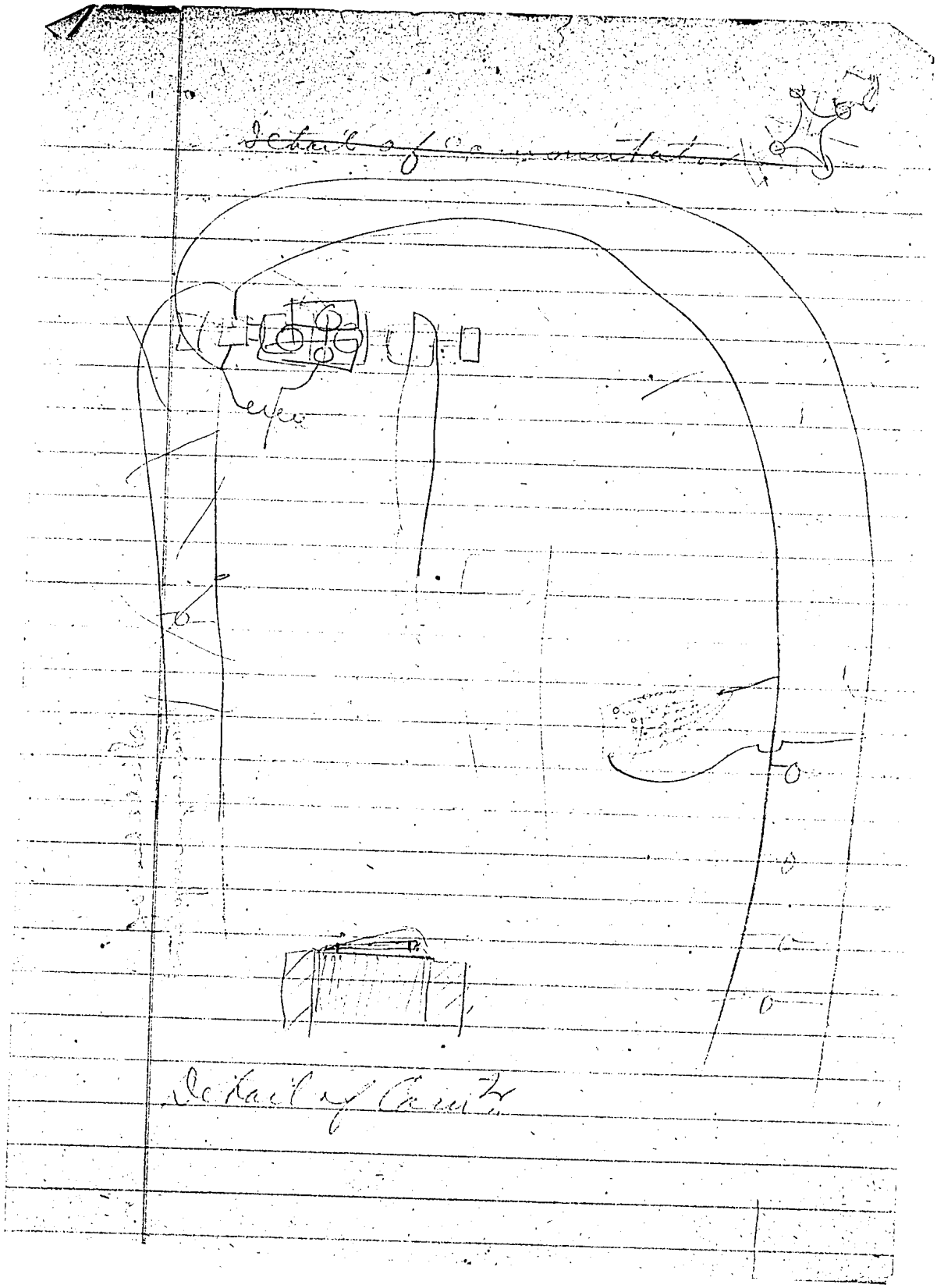
See 2y

I gave you a patent to write where I used several the Continuous fibre -

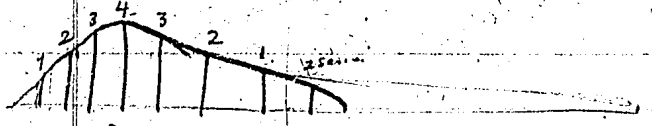
add -

The fibres may be laid ~~straight~~ and Carbonized and afterwards ~~the~~ ~~[illegible]~~ they may be twisted together tightly by means of the Carbon Ends and while so twisted are clamped in the clamps upon the leading in wires of the lamp and may then be Electroplated thereto while the fibres are under Torsion, If the fibres have been twisted previous to Carbonization (1?) they must be against twisted & placed under Torsion while being sealed into the Lamp.

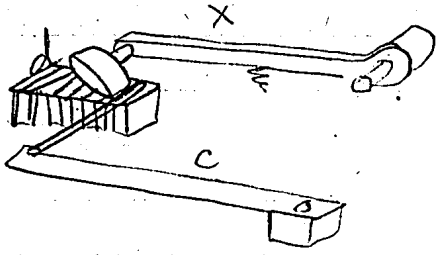
Skeleton of
Agro-engineering

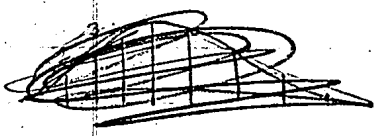


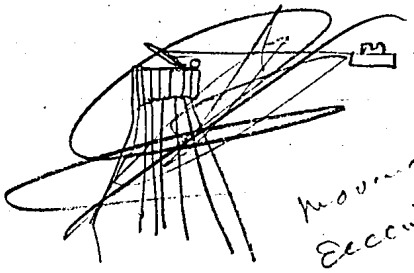
Lamps



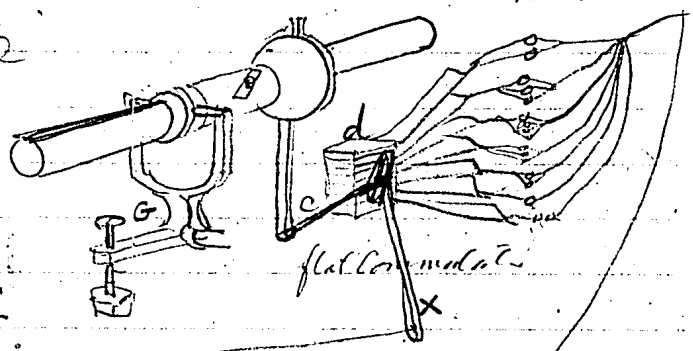

Curve showing acceleration Spring due to Explosion in open Exp. 2 Lamps 1 burning in



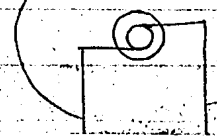




Lamp




Deeby Dont forget/about/the new Engine Regltn (Knife) just out,

Sonhauswirme Explosions



BERGMANN & CO.

108-112 WOOSTER STREET.

(BY APPOINTMENT.)

MANUFACTURERS OF EDISON'S INVENTIONS,

EDISON'S ELECTRIC LIGHT APPLIANCES A SPECIALTY.

New York, 1882

Seely.

Write patent on method of ~~render~~ Equalizing the Electromotive force of Dynamo Machines driven by Gas Engines -

Gas Engines are worked by Explosion + The Speeds consequently irregular. The Engine accelerating at Each Explosion Causes the light to increase in intensity To obviate this Replace upon the ~~rotating~~ rotating portion of the Engine an Eccentric or Cam, Which cam may be set in any position. a strap over the Cam Carries a rod or arm which serves to close and open an Electric circuit.

The cam is so set that at the moment of Explosion the circuit is closed + a number of incandescent lamps are thrown across multiple arc in a circuit otherwise open there are other Lights. The effect of adding these Incandescent Lights or ~~were~~ resistance Equal thereto is to Check the rise in Electromotive force due to acceleration due to Explosion +

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EDISON'S ELECTRIC LIGHT APPLIANCES A SPECIALTY.

New York, 188

this renders the light constant no matter how the Engine runs unequally.

If An Otto Gas Engine is used the gas and air should always have the same proportion as the amount of gas is diminished the relative proportion of the air should be diminished in this manner an explosion can be made to take place at every revolution and the compensation due to throwing in lamps or resistance acts perfectly.

Instead of throwing resistance across multiple arc at the moment of Explosion the Circuit Controller may throw resistance in the Circuit & thus accomplish the same purpose

In cases (Where Explosions do not occur at every revolution, a Gas Engine governor may be used the movement of the sleeve of which throws resistance in or out of circuit or across multiple arc.

It is obvious that motion may be derived from any part of the Gas Engine or

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EDISON'S ELECTRIC LIGHT APPLIANCES A SPECIALTY.

3 New York, 188

attachments connected therewith to Control an Electric contact device whereby Compensation for difference of Speed may be attained -
~~Even an Electromagnet~~ the Electric Compensating device may be placed on any mechanism Controlled or operated by the gas Engine for instance on the shaft of the dynamo itself -
~~Claim an Electromagnet with armature~~

Claim Very broadly a circuit Controlling device in a gas Engine or mechanism controlled thereby for compensation for intermittency due to Explosions -
This is entirely novel & Prof Draper reports that its work Beautifully it is very valuable in England so prepare an English ~~Patent~~ & Continental ~~act~~ -

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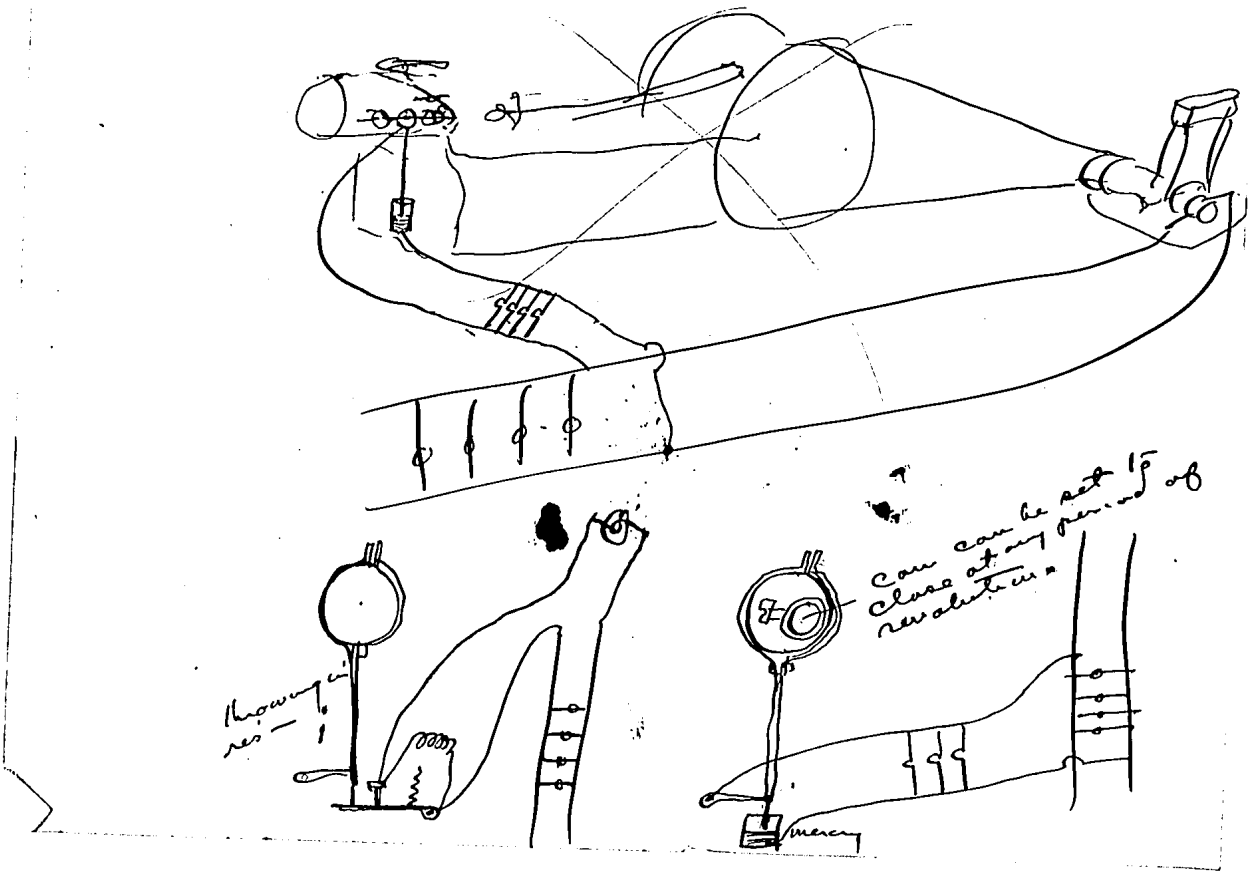
4 New York, 188

Get Schleicher & Schums Co Catalogue or cut from Clarke Books I think he has a description of the Otto Engine with drawing in some of his Books or on the rotating shafts that lifts the inlet cock put an Eccentric.



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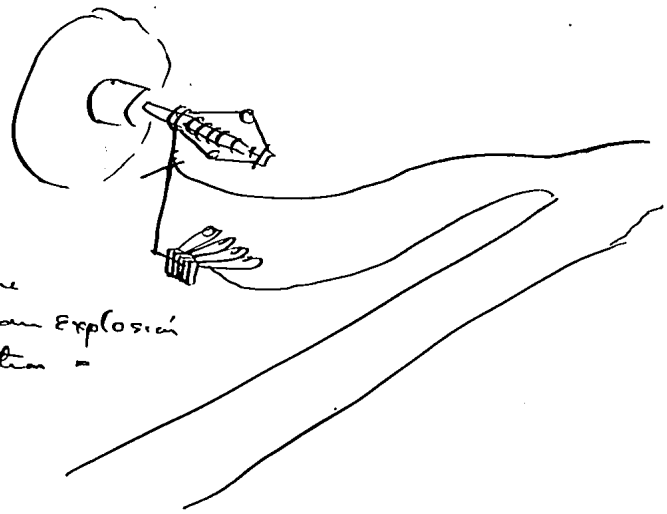
MANUFACTURERS OF EDISON'S INVENTIONS,

EDISON'S ELECTRIC LIGHT APPLIANCES A SPECIALTY.

New York, 188

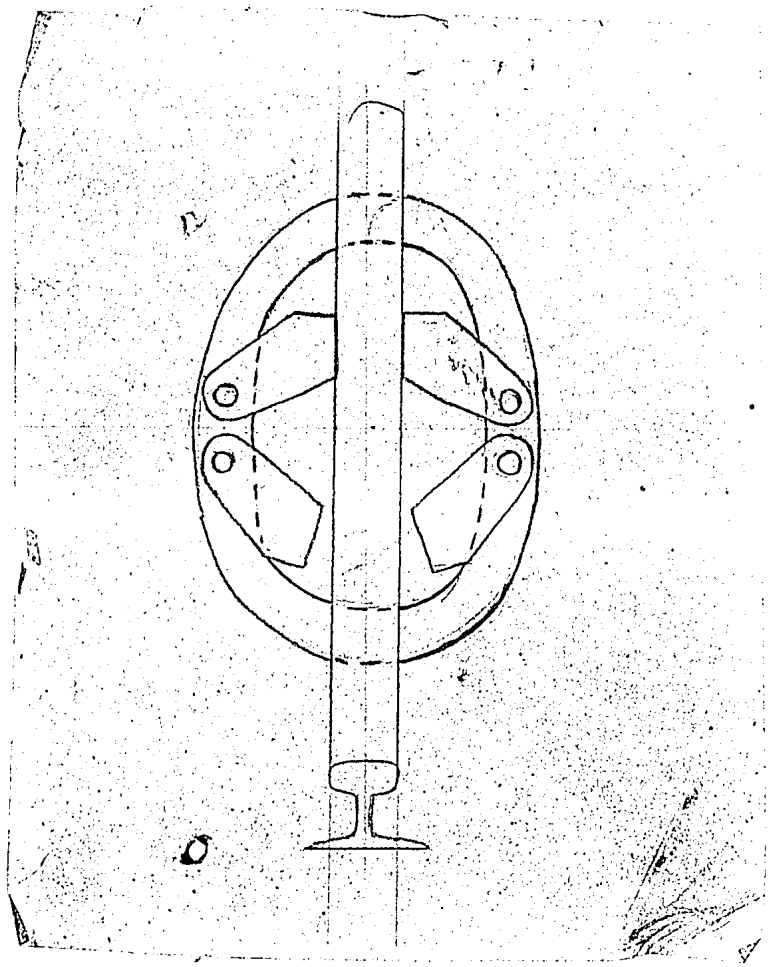
To

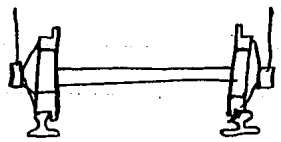


device where
there is not an Explosion
Every revolution -

New York Nov. 1, '82

V. F. W. Sellers





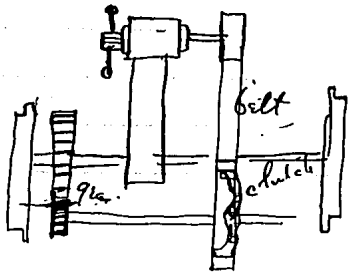
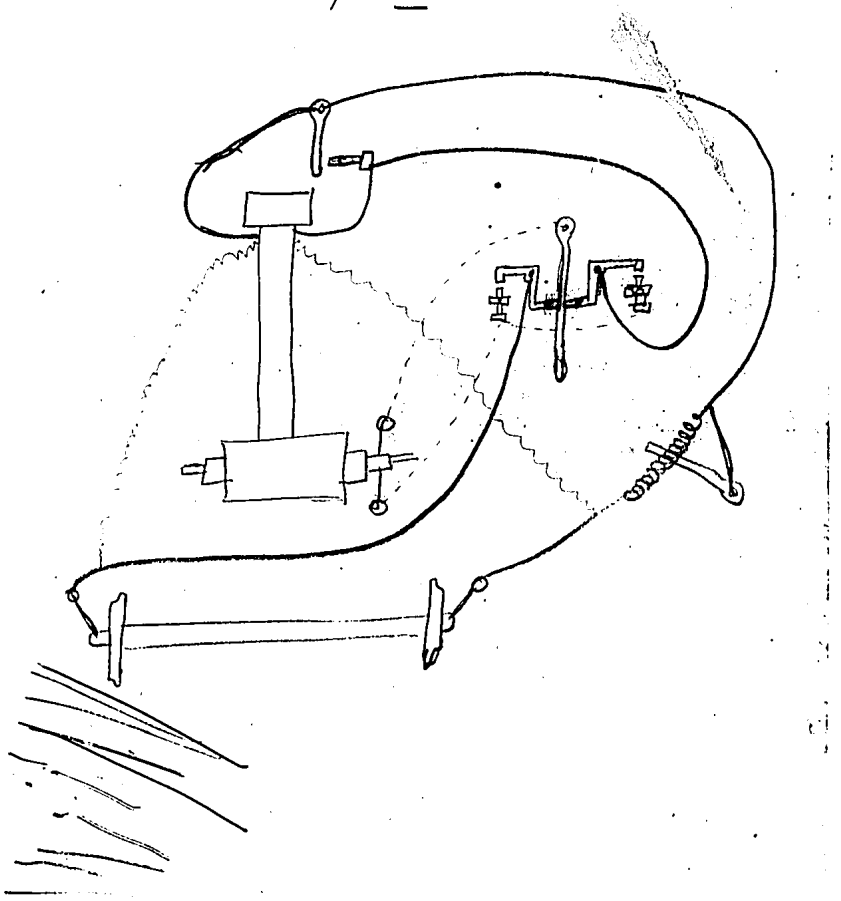
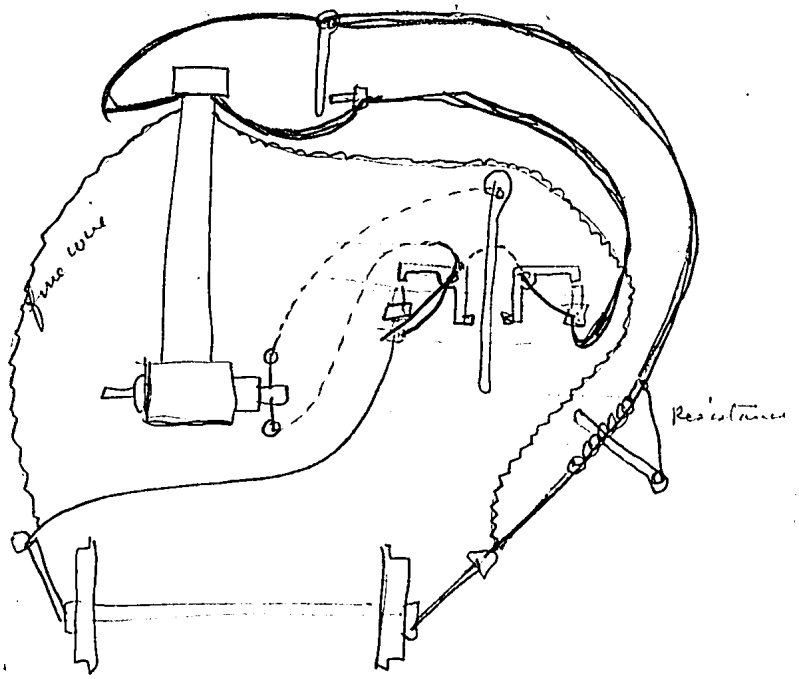



Fig 1



T. A. EDISON,

Menlo Park, N. J., ..... *1881.*




Mention that the Coarse wire may be multiplied around the armature as the fine wire & may be disconnected & all Coarse Shunted leaving fine wire to Rear

upfield –

Kulman

Dyer:

Want to take out a new application in England and the U.S. If you do not think it sufficiently covered already

Ask that draughtsman down stairs for a picture of Mason Clutch = X is the mason clutch

R is resistance that are in the main circuit and permits of the slowing up of the train. This appears to be essential because in both mine + Siemens I don't remember where any measurements shown for slowing up the train. You might mention that the fieldmagnet could be weakened or the Commutator

2

brushes moved around from the Cab of the Locomotive by means of a rod with worm + worm wheel, but the method shewn is more to be preferable in practice,

Another thing is Doublewound fieldmagnet so that in ~~starting from a stationary~~ Cases where the locomotive is slowed down very considerably by heavy load the armature will not cut ~~all the~~ too much current away from the wire upon the field. If we had a single field + this was multiple wound across the armature it would have sufficient

Current passing through it,
to produce the required field
owing to the Counter E.M.F.
of the revolving armature
But if this was slowed
up very much the fall
off of the normal current
in the armature would
be so great that the
field would get
very little Current hence
the power of the machine
would rapidly diminish
to prevent this I put
only keep the fine wire
on the field across
& throw in a coarse wire
Coil right in the same
circuit as the battery
or in other words make it
a Dynamo for a while,
this keeps the field up



and when the load becomes
lighter etc the lever G
cuts the coarse wire out
of the main circuit

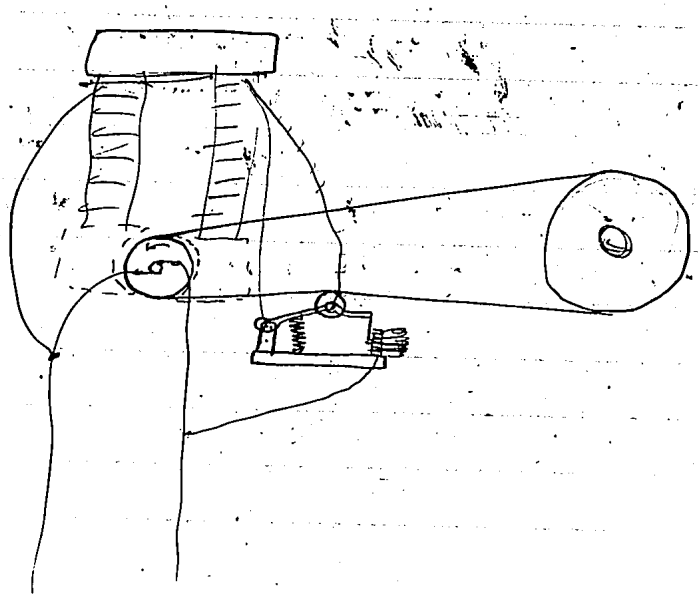
d d is the fine wire
regular field wire,

Did Siemens take Current
off of more than one
wheel, I think not.
I remember I had another
US application where
this was shown - get this
& ~~Make~~ what is good out
of it for the new English.

I propose to put a ~~[illegible]~~ pinion gear
on the shaft where X is
meshing into a large gear
on the main drum -
I wonder if we could not get

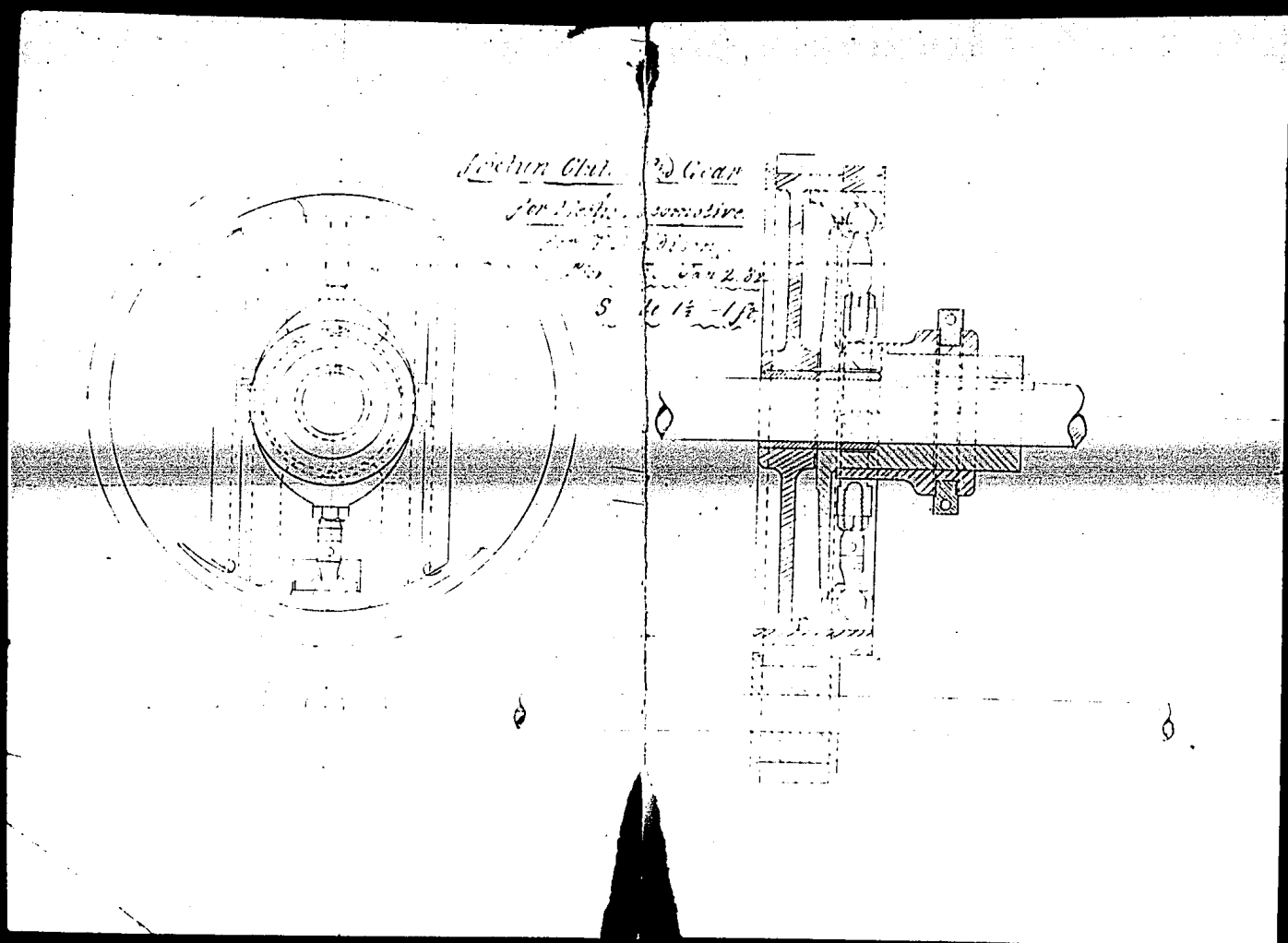
a Combination claim of Belts, friction clutch or Equivalent disconnecting mechanism ~~and~~ gears.

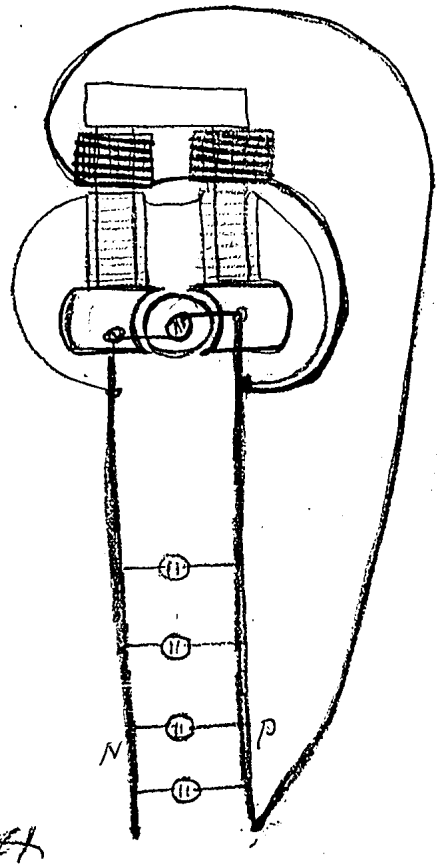
Have we in any our cases spoken aff Nickel plated Ends af rails, nickel plated flish plate —
also Japanned rails —



Regulator = an arm carrying a wheel runs against the driving side of the belt + is held up against the belt by a powerful spring as load increases the arm is thrown downward. Compressing the spring + cutting out resistance thus regulating the C.M.f.

Whitehead
N.Y. Univ. '88






Witness

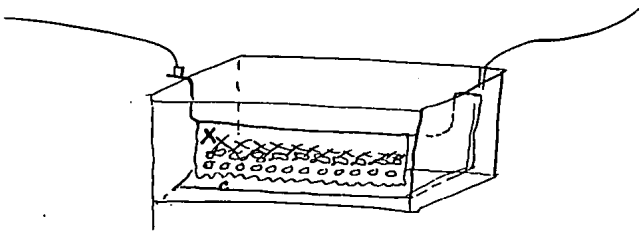
S D Wilcox

4

8,

January 17 1882

Patent.



Dyer=
Newpatent,

I take Cloth with various figures, Lace, Baskets of wickerwork or any article of manufacture made of Carbonizable material, Carbonize the same under strain pressure or Bath to prevent distortion, & make them into articles of Carbon still preserving their form, I then connect them to the poles of a Battery or other source of Elec in an Electrolytic Bath & deposit Copper, Gold or other metals over their Entire surface of the required thickness, They are then taken from the Bath & straightened if distorted

and the same is a new article of manufacture by a new process useful for ornamental & other purposes.

Claim 1st new article of manufacture Electroplated Carborized good,

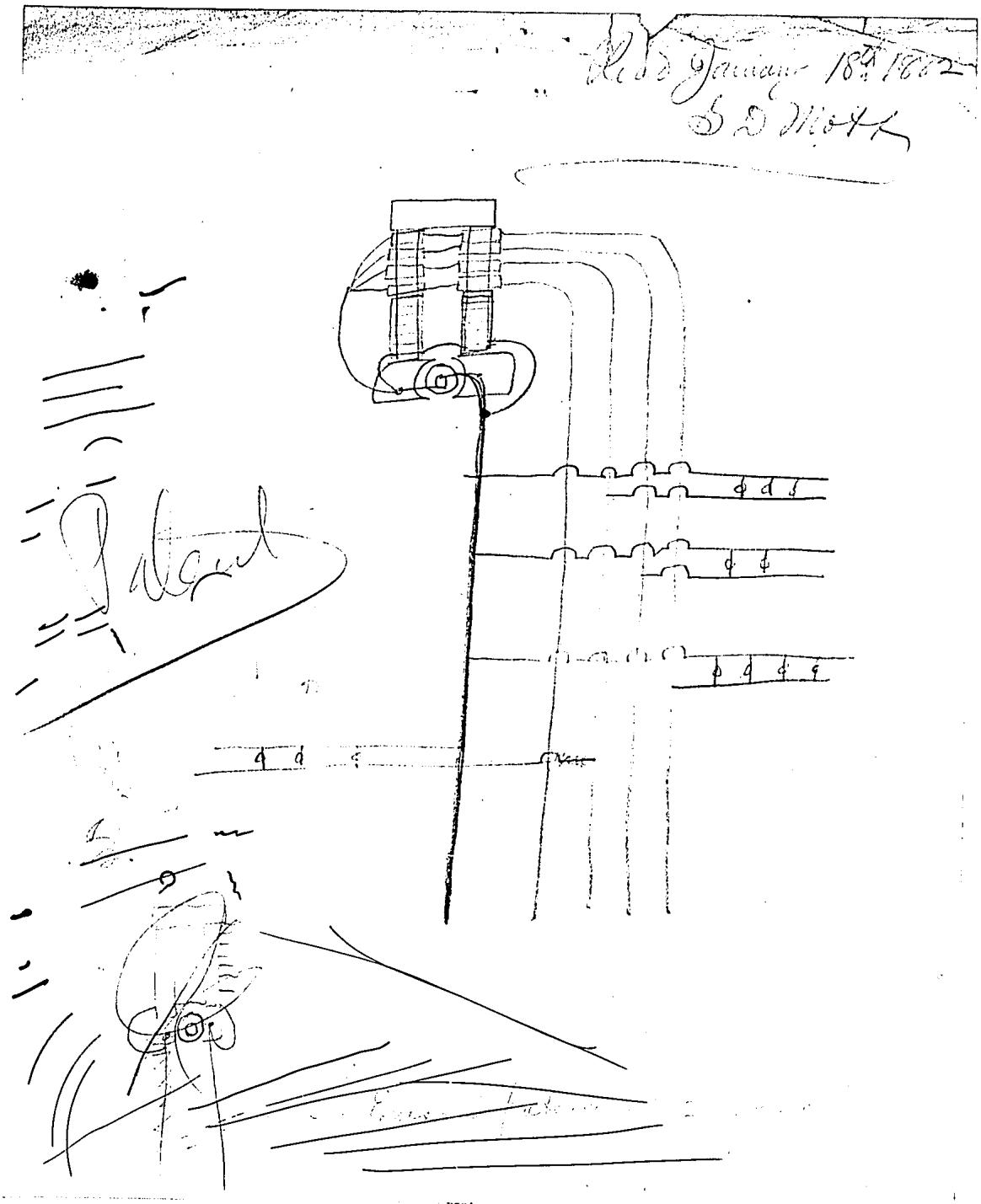
2nd process ~~of~~

3rd Carborizing woven or plaited goods or articles manufactured from Carborizable materials & Electroplating the same after Carborization

Etc

Etc

W. Wesley
Jr. Oak. 2nd



Oct. 28 1882

A. W. Seely.

Hollow Carbon filament

I make these by wrapping a wire of zinc or other metal with tissue paper or coating it with sulfo or Cellulose & any form after processing the Carbonizable fibre & withdraw the core, or eat it away by acid. Especially latter process if the cellulose is to be galvanized by hydrofluoric acid. These Hollow filaments are then carbonized in the regular manner —

These filaments may be square or of any shape.

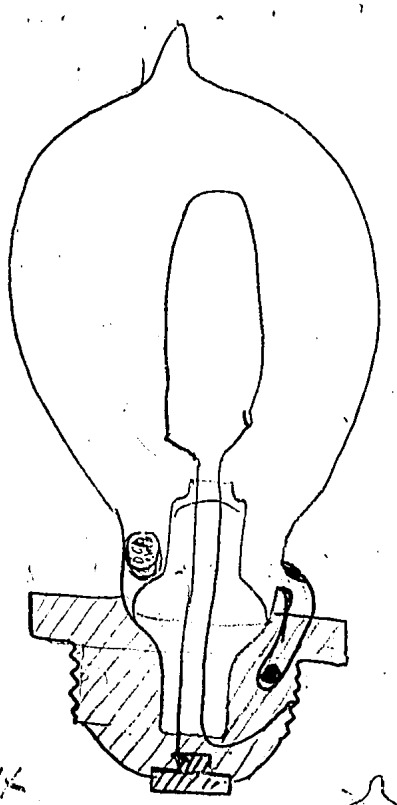
Claim a hollow filament of Carbonizable material

2. a Hollow filament of Carbon —

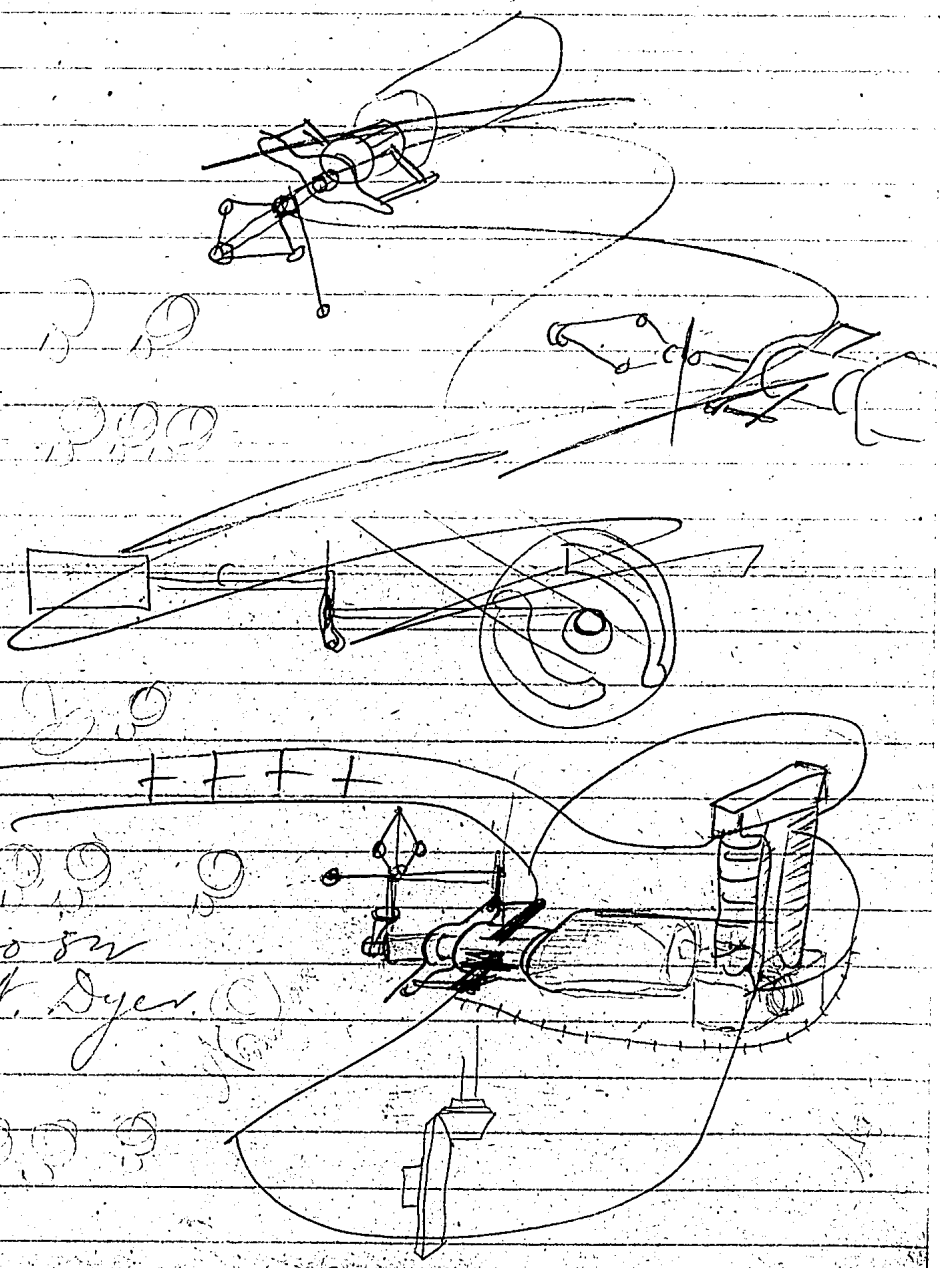
Mention that wires formed of hard pitch, Celluloid, Resins can be coated with cellulose & treated & afterwards the Resins can be dissolved out by Solvents —

! — January 1882 —

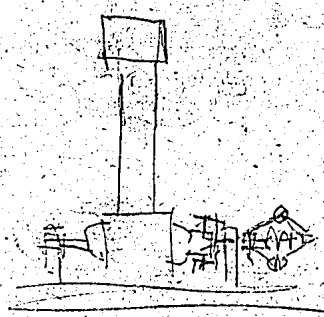
14

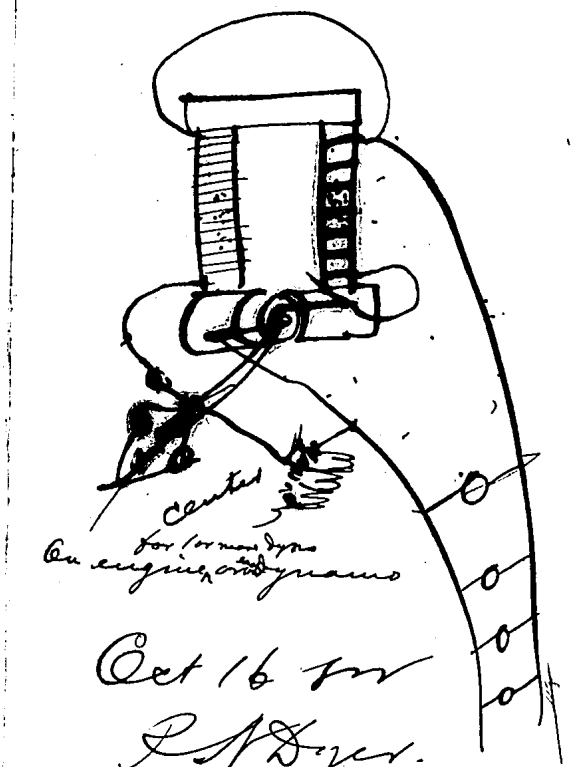


Witness
C. A. Clark
Jany 21 1882



Oct 20 8m
R. K. Dyer.

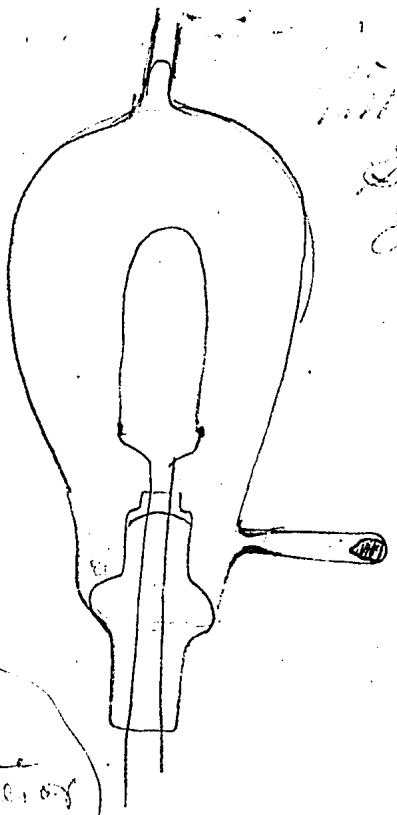





Oct 16 '88

P. N. Dyer.

Coarse
Standing on one leg,
or over fine winding
of both legs.



Another one we made with crystals of naphthalene.

See if we have any application for this in U.S. also England —

Patent or guarded or insulated clamps or terminals =

The Metallic portion of the leading in wire & the clamp and nearly all of the ~~Grand~~ broadened End of the Carbon filament is covered with several Coats of japanned varnish well baked ~~so that it is made practical~~. This protection ~~possesses~~ to a considerable extent the Electrical Carrying from the Carbon Loop by diminishing the area of Contact ~~of the~~ of the Electrode with the residual air thus increasing the resistance of the discharging space,

Claim Insulating the metallic terminals within the globe of an incandescent Electric Lamp —

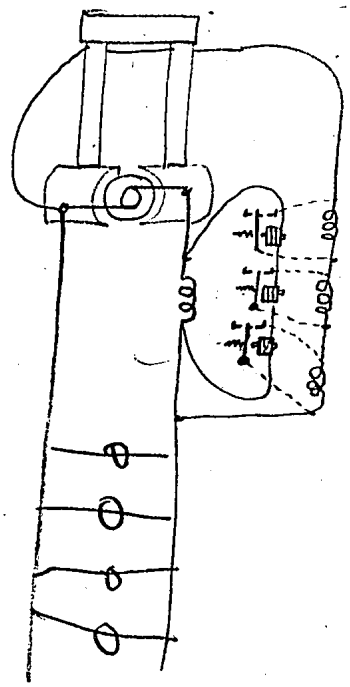
Insulating the terminals as of the filament of Carbon

within the Vacuum chamber

the use of Japan ~~Varnish~~
or other Varnishes having
a drying oil as ~~a Gum~~
~~a Gum Gutta~~ in

Mention Collodion may
be used + other Compounds
such as ~~glucose~~ glue
which can be applied in
a practical state,

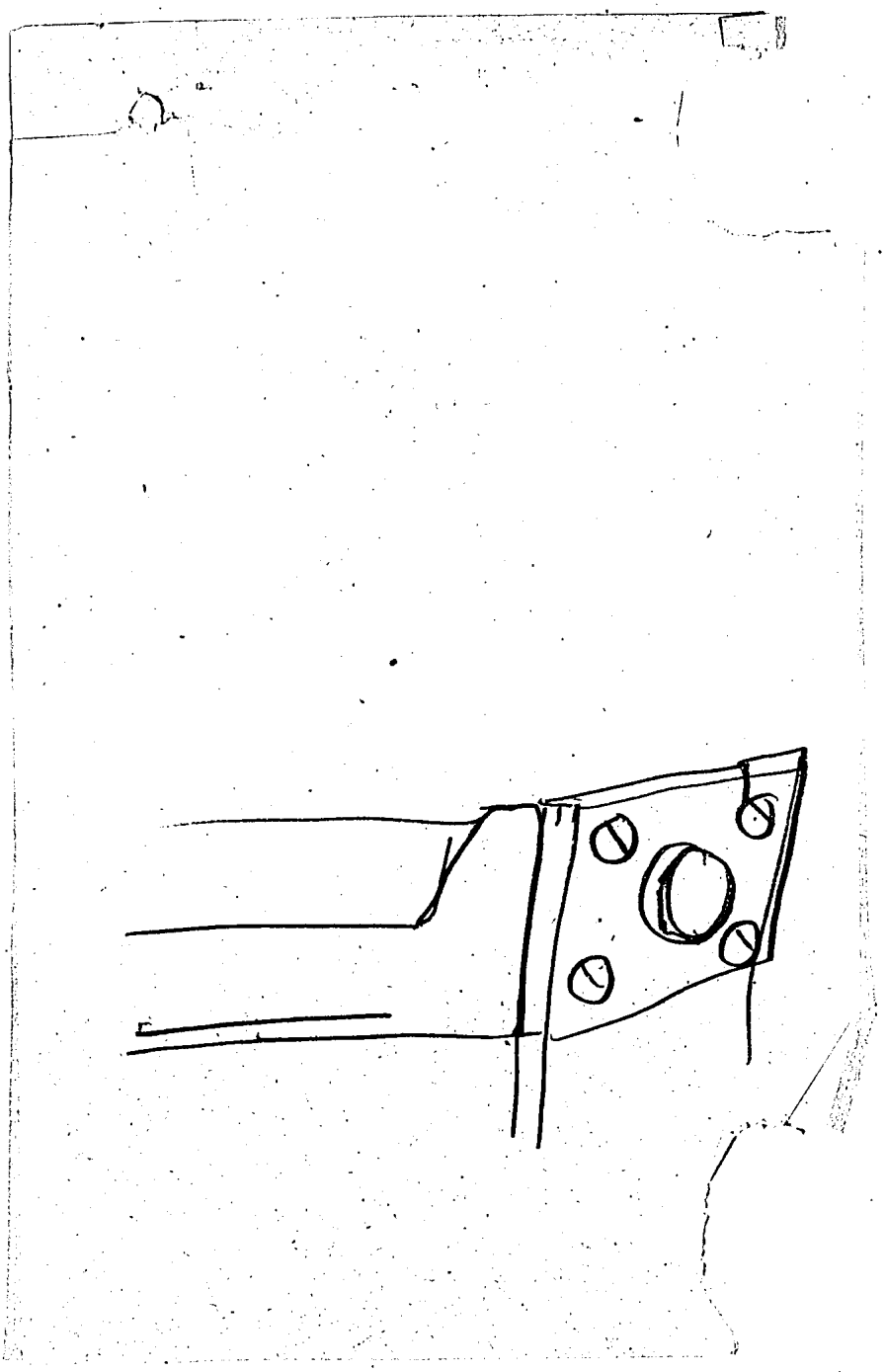
New York
Oct. 19, 52
W. W. Seely



Sheet 1 of 2

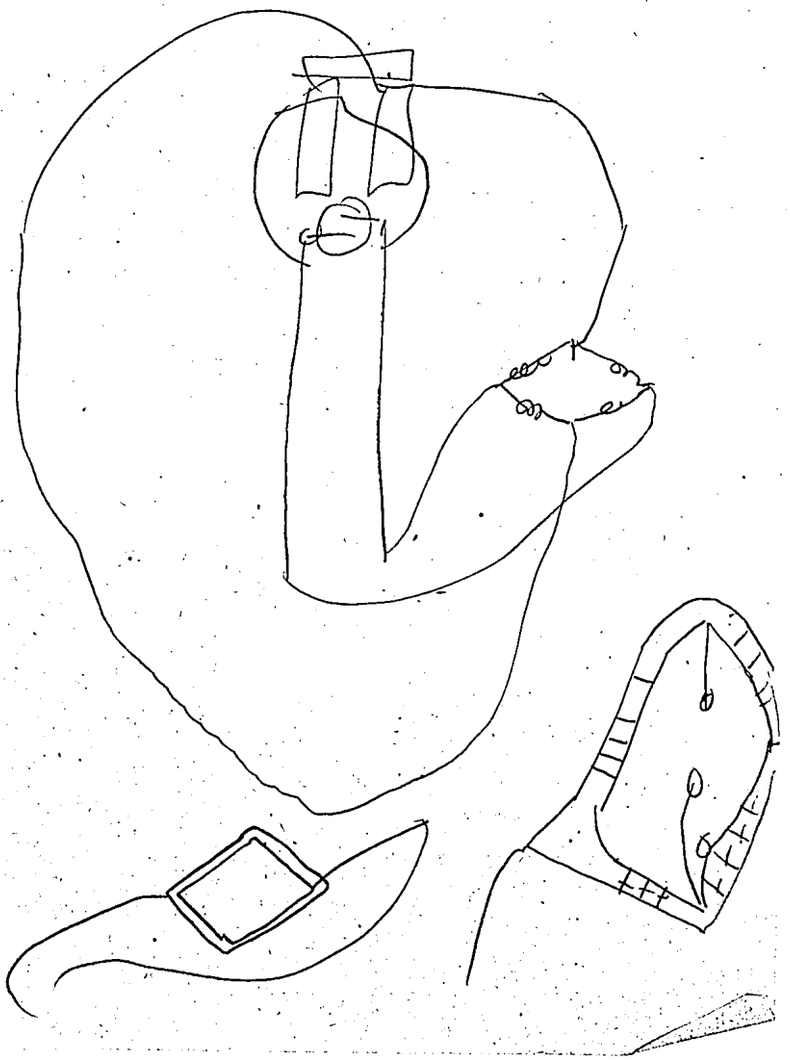
W. Dillon

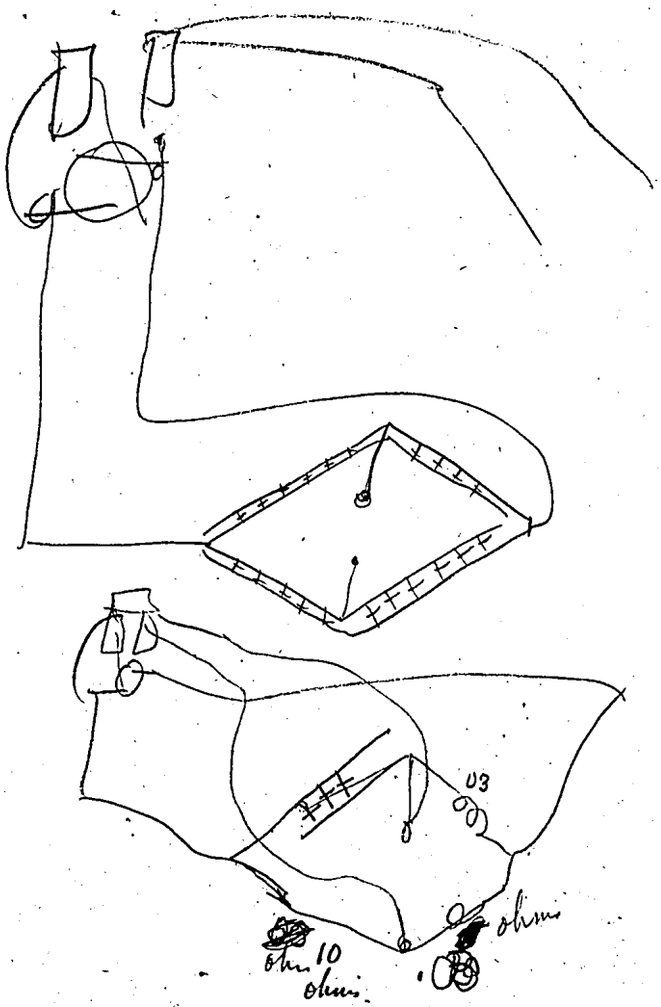
January 21 1858

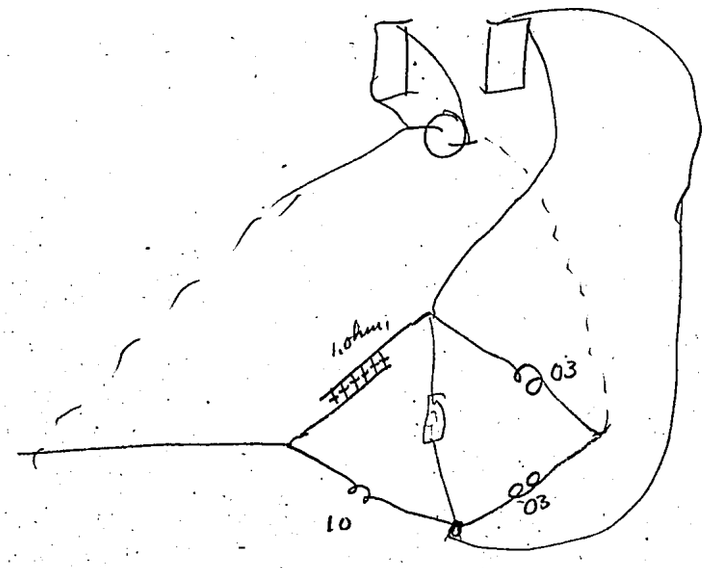


These sheets left by Mr Edison with me, this 11th day of October. 1887

Rich'd N. Dyer




03
10
ohms
ohms


1 ohm
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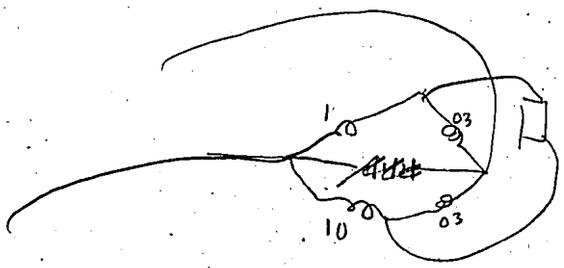
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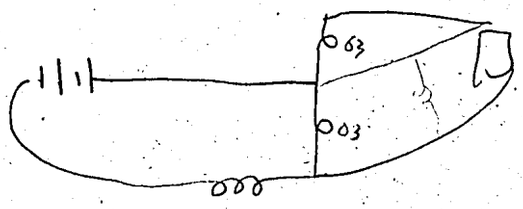
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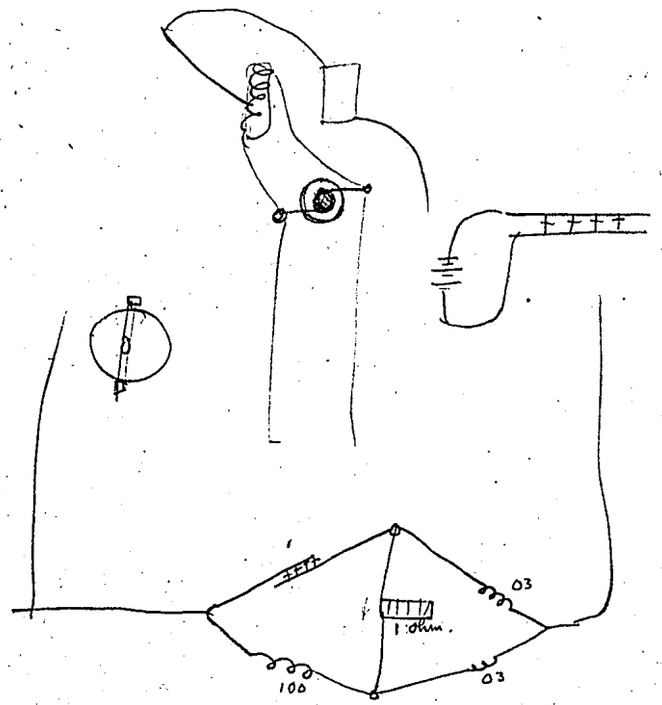
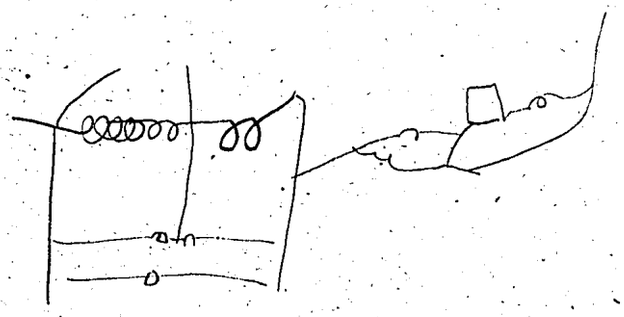
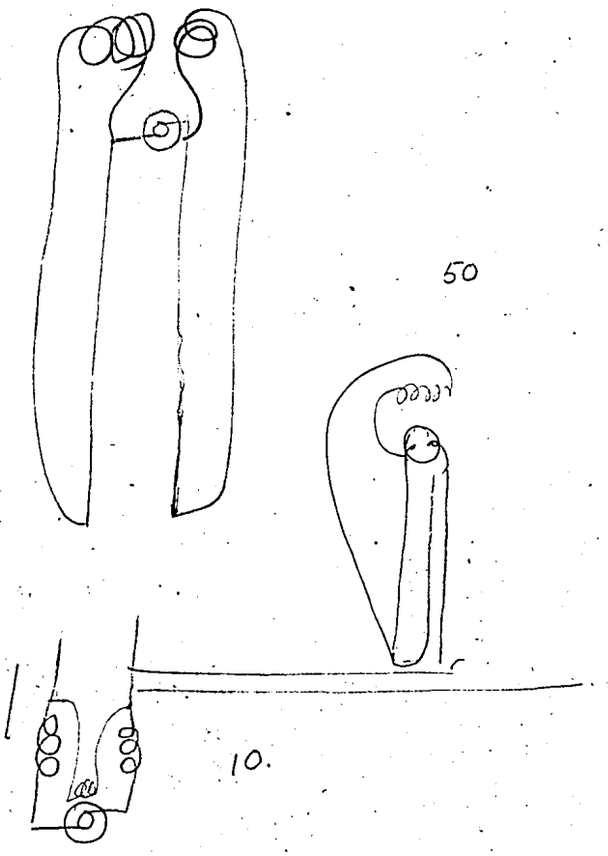

03
1 ohm.
100
03

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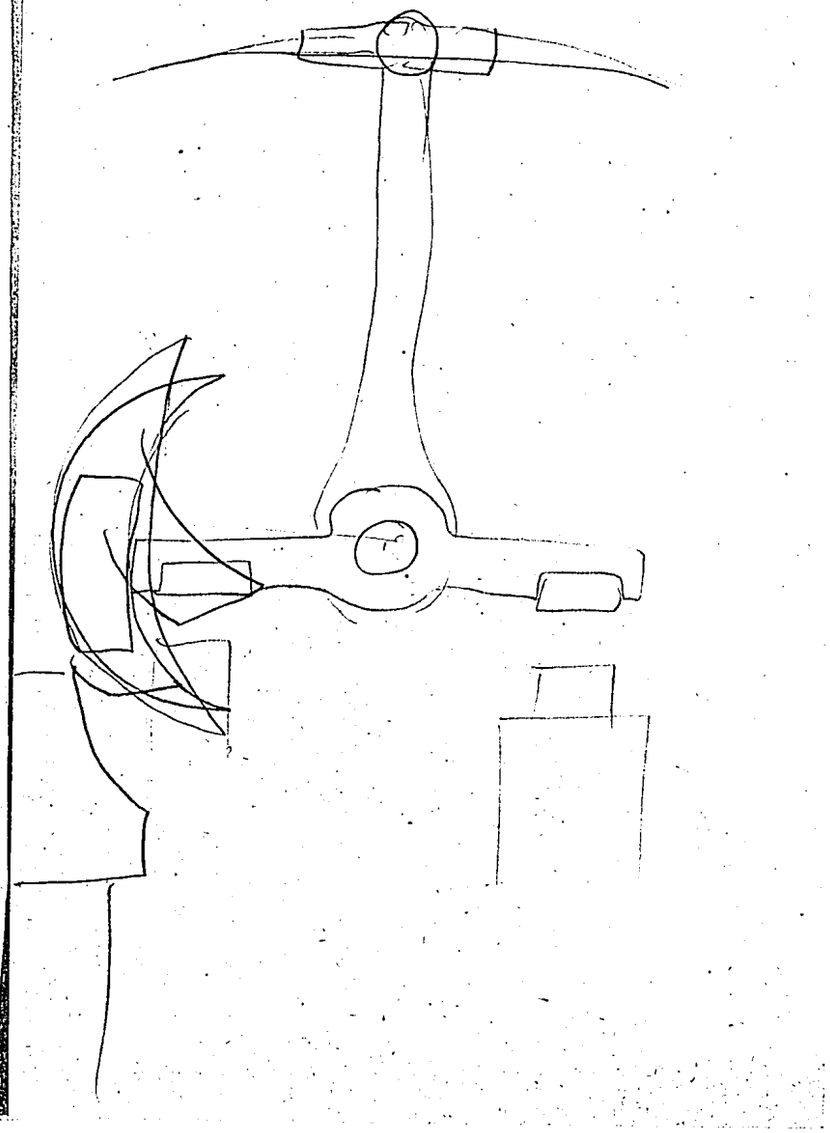

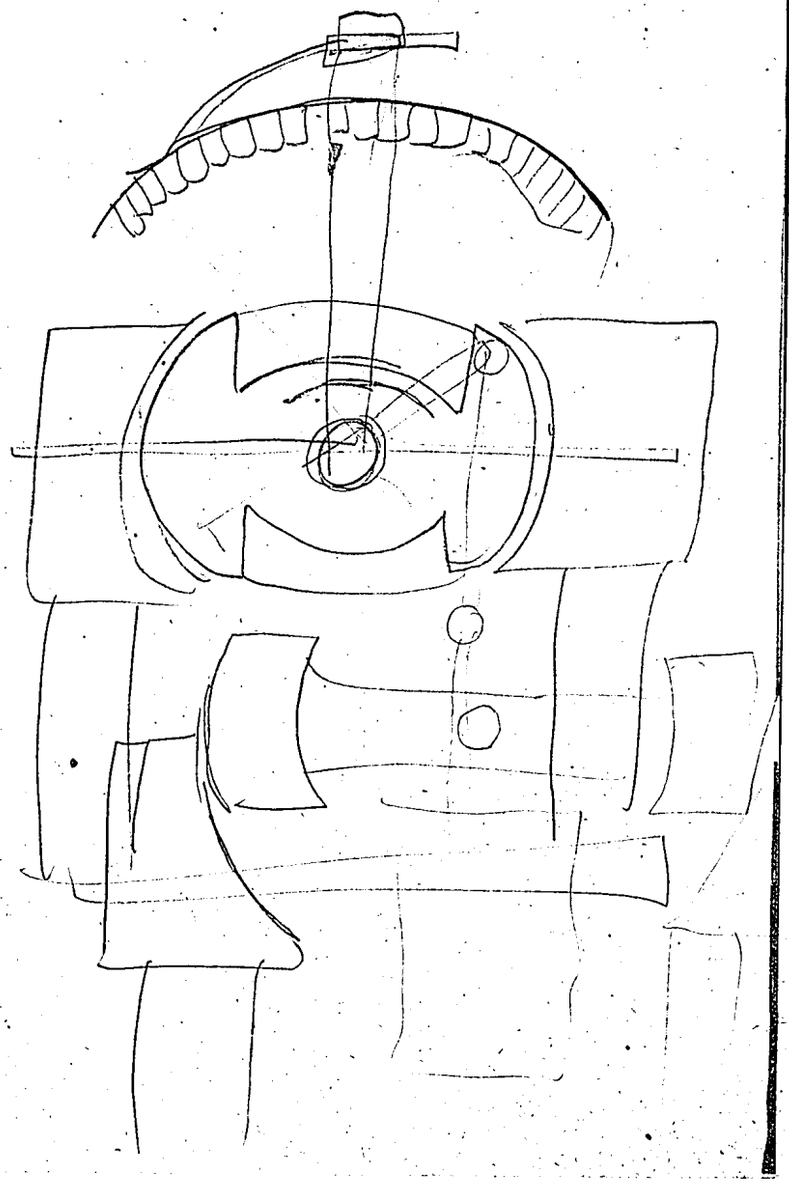

56/1000 | 18
56
440
448

250 ft lbs per ohm
500 feet per ohm
272 turns per ohm

9 turns.
22
9
198 — 24 — 16 feet.

22 | 500 | 22
44
60
44
18
36
108 | 40 | 20000 | 500
200
54
648
22
1296
1296
14259

36.
18
288
36
648
16
3888
648
1036

11000 | 40
440000

500 | 272
500
2400
2000
1600
1360
2400 feet

11000 | 250
48
220
220

10692 | 22
12831 | 12
83
72
108
108
3

250.

40 | 440.000
40
40000
40000
40000

36
1.
180
22
360
360
3960
3960
15840

12 | 15840 | 1320
12
38
36
24
24

48
2
96
7
672

672
364

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3 | 364
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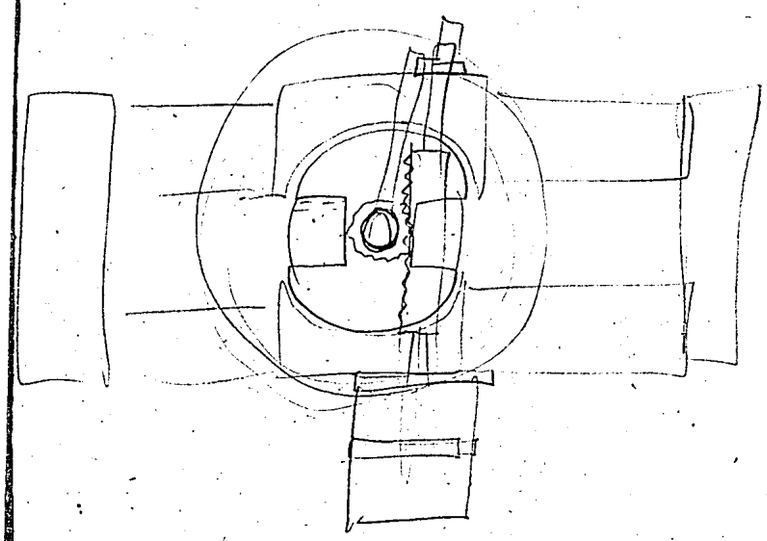
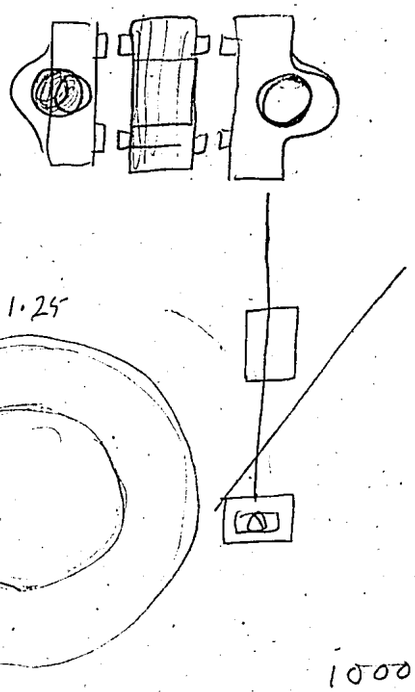
115

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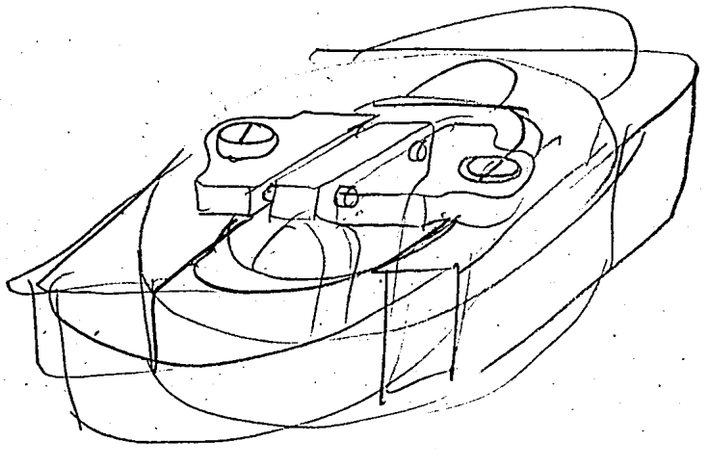
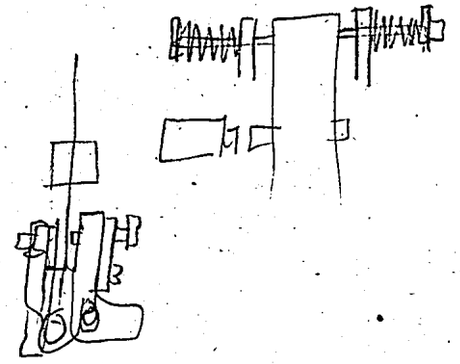
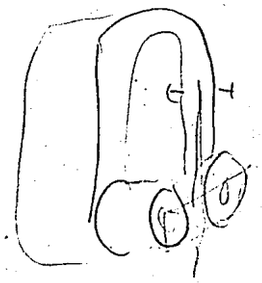
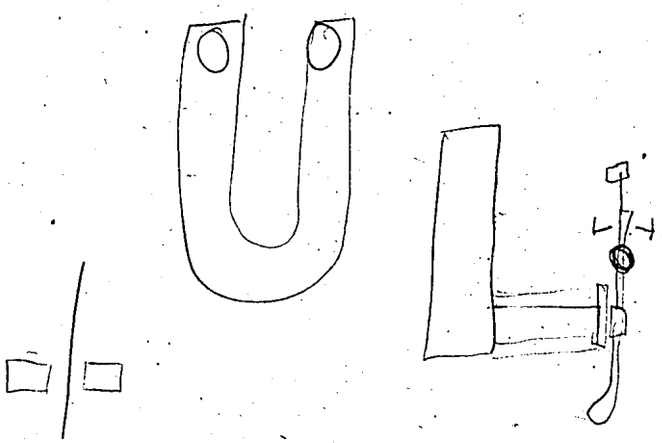
6
3.









20000 feet

44 × 6 = 264

220 × 220 = 4400 + 440 = 4840

2

44 | 260 | 5.6
220
300

230 × 230 = 6900 + 460 = 5290

250 × 250 = 12500 + 1250 = 13750

44 × 9 = 396

440 × 625 = 2200 + 440 = 2640 + 275000

240

44 | 11000 | 250.
88 | 50
220 | 220 | 12500

40 | 250 | 6
240

110000 × 40 = 440,000

440 × 529 = 440 + 2160 + 2116 = 232760

44 × 4 = 176

100 | 176.

50 | 4400 | 100
400 | 400
400 | 400

150 | 8800 | 176
150 | 500
350
300

2437/100 Values per

20,000. feet

2½ ohms.
1 ohm.
330 feet.

4 | 1320
330.

60

660

4 ohms

1700 feet per ohm

36
20
720.
22
144
1440
1584

12 | 1320
12
8
36
24
24

51
25
12
6

.050

4 | 1700
~~425 feet per ohm~~

330 | 1700 | 5
1650
50

50
25
12

20
10
5

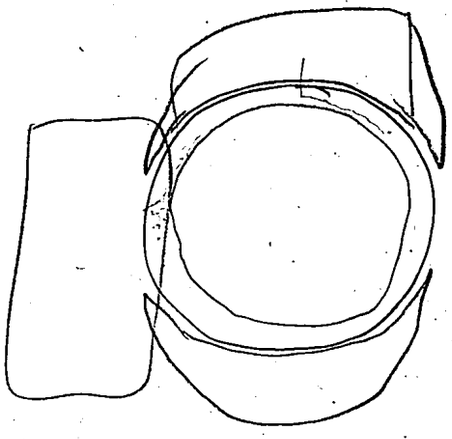
30 · 660
15 · 1320
7½ · 2640
3.75 · 5280
1.85

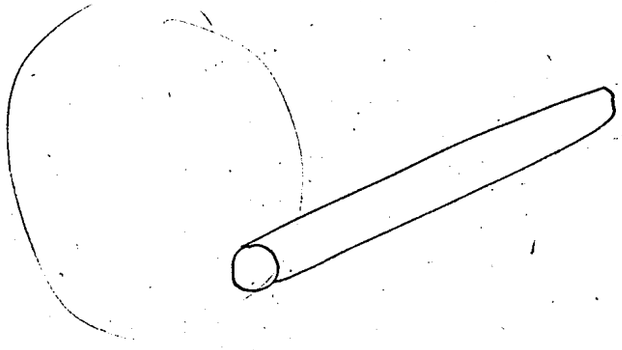
1/5 of

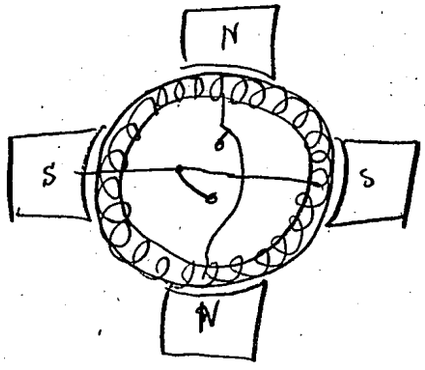
235
235
1175
705
470
55225

240
240
9600

552
440
22080
2208
242880





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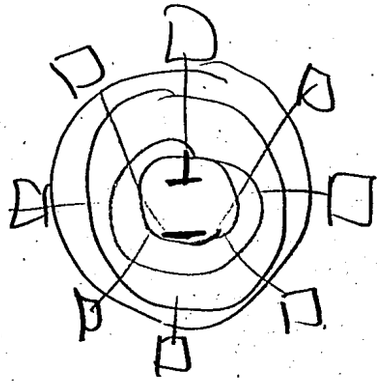


2625 at 250 42 ohm

~~1100~~

2025 " 330 26 "

77.5

15

2 100
2 50
4 25
8 12

12 | 600 | 50.
6

50. 100 12
.12 50 50
.038 25 60

7 10

2.37 Vebers on 20000 feet.

1 " Veber with 1 Lamp on

2½ ohms 330 feet. 231578

1.90 | 440.00000 | 231578
380
600
570
3000
1900
1100
950
1500
1330
1700
1520
1800
1710
900

60 Vebers.

25 | 1660 | 66
150
160
150
10

60. 3300
30 6600
15 13200
7.50 26400
3.75 52800
1.87 105600
.93 211200

1 10 10
5 20
3 | 250 | 40
83 | 8
1. 10

166

16
60 | 100 | 1.66
60
400
360
400

21 | 166 | 7.8
148
18

1.66.0
14
8
2.50
1.90.50

75 / 100 / 1.3
75
250
225

1.66
14.
1.80

1.30
130 65
300 32
116
8

1200 / 1400 / 1.16
1200
2000
1200
8000

166 / 11.8
14
26
14
120
112
8

80
1000.

.84 / 100 11 / 100 / 9. Volts fall.
99

20 / 100 / 5.

60 / 115 / 1.9
60
550
540

14 / 190 / 13.5
14
50
42
80
70

13 / 100 / 9.7.
91
90

950
3
285
12
00
00
570
285
0000 / 28.50.
12 / 342
24
102
96
60
60
0

42
3
126
250
630
250
315
24
72
30
24
60

3 / 5200 12 / 2625
1740
2
3480

44
44 } field
20 Cross Ends
24 Corn
48 2 beans
24 Coupling
36 Eng bregs
22 Crank
18 gour
280

3 | 50
16-2

4 | 38
9-2

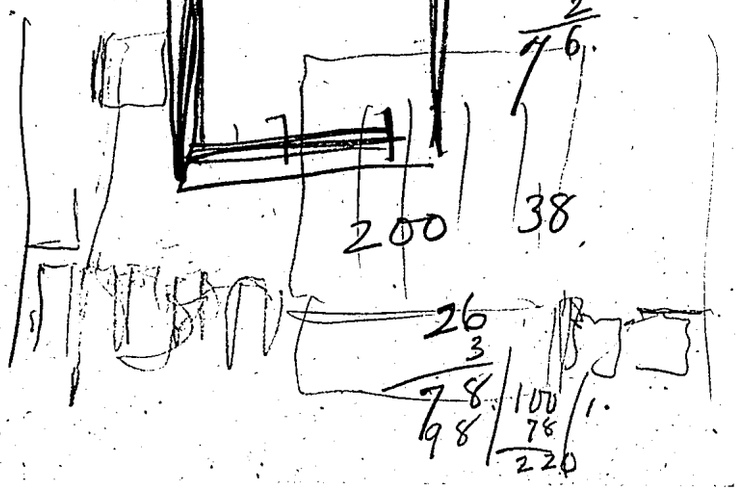
12 | 35250 | 2937
24
112
108
45-
36
90

47
3
141
250
705-0
282
35-25-0

12 | 280 | 23
24
40
36
4

3 | 50
10

38
2
76

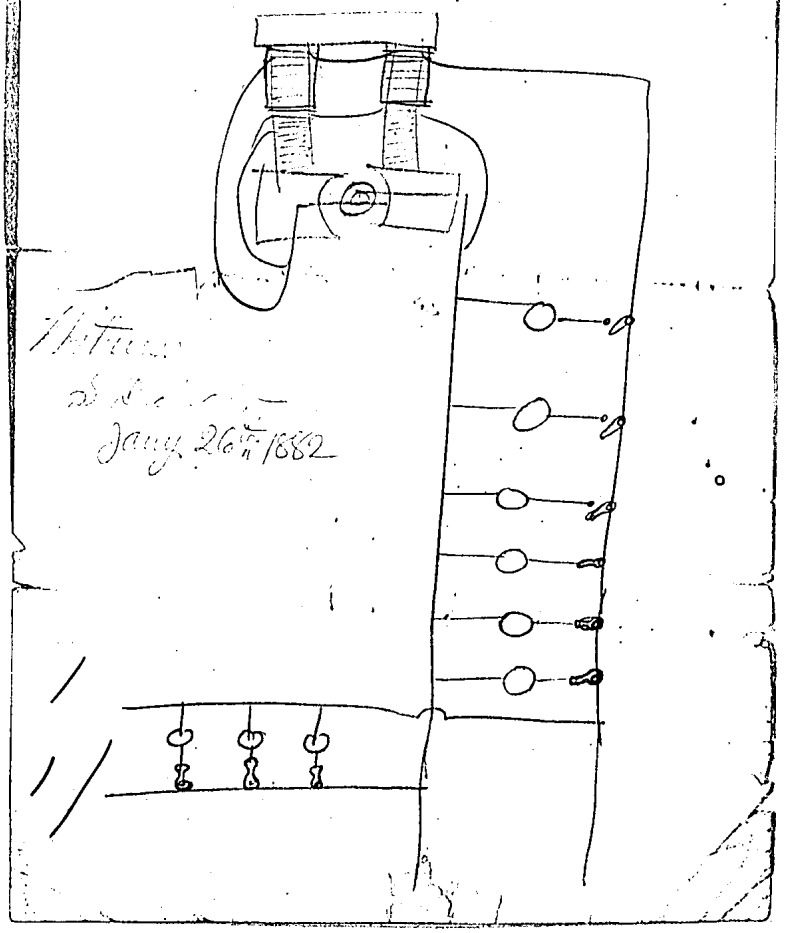



26
3
78
100
76
220

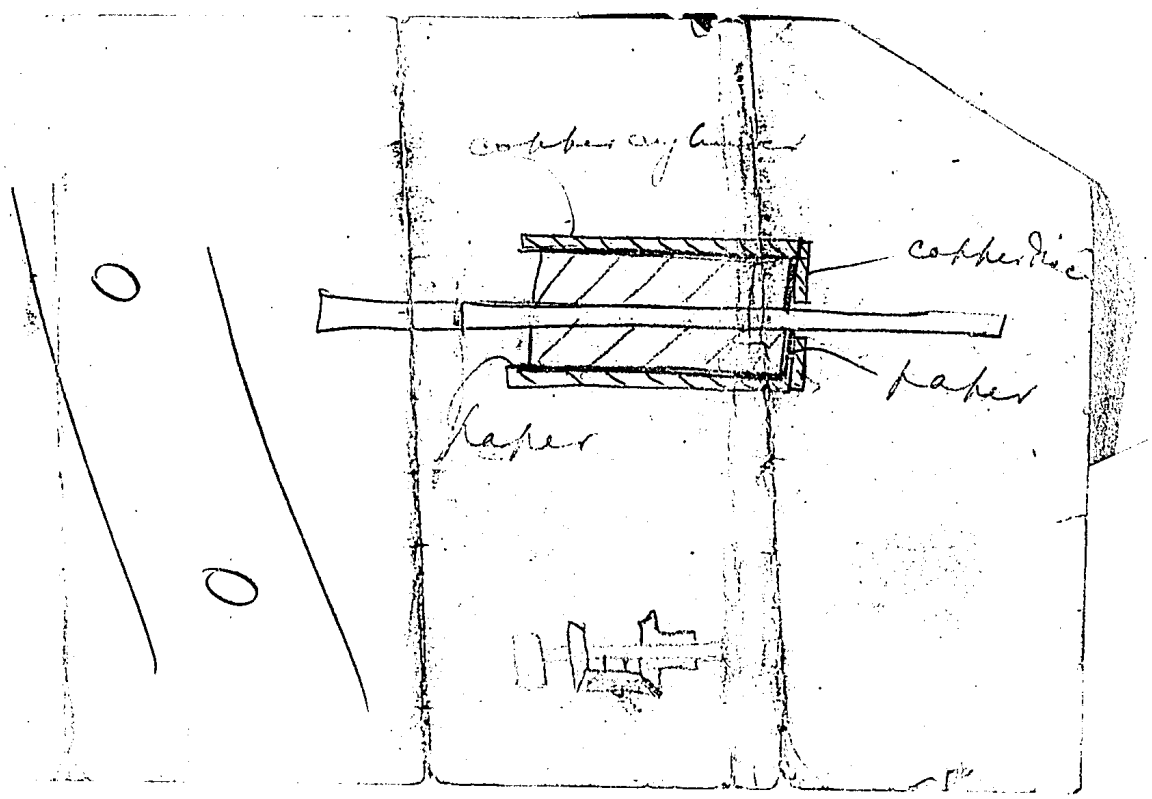
98

12 | 33750 | 2812
24
97
96
15-
12
3

Look up Branch
of the Document
Covers this petition



Petition
Jany. 26th 1882


paper
paper

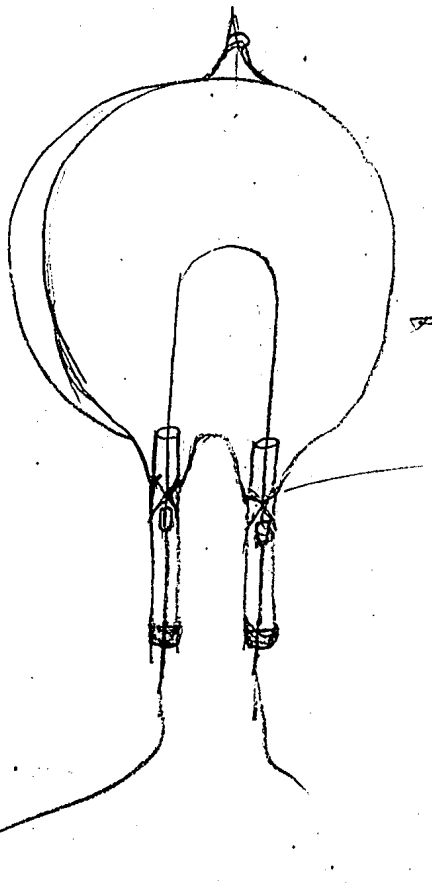


Fig 1

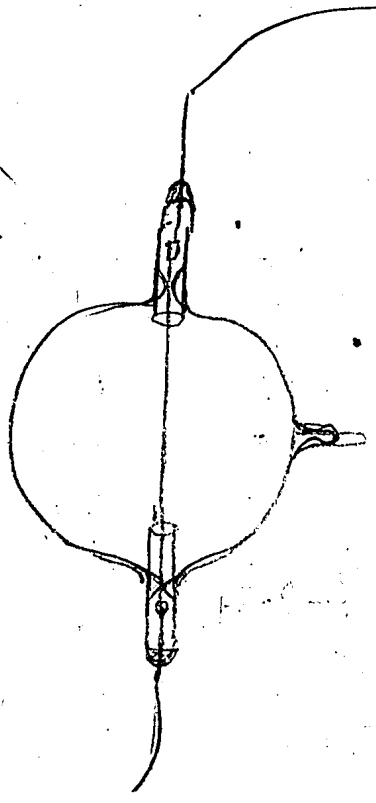
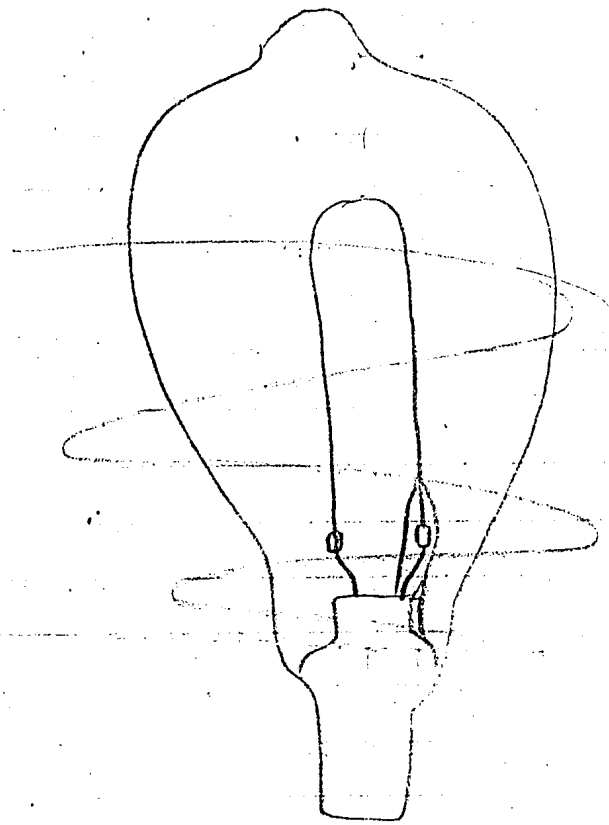
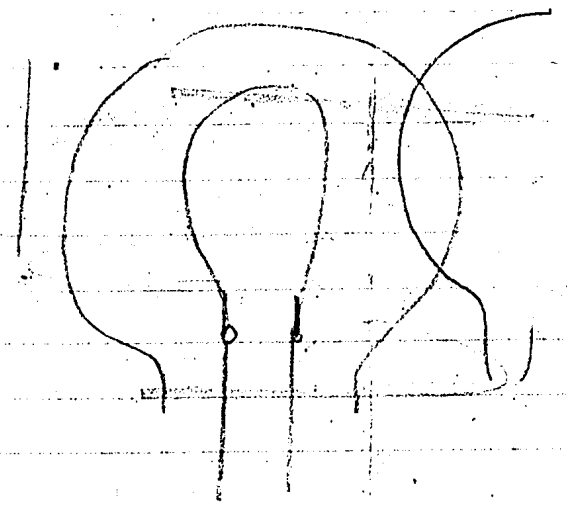


Fig 2

Jan 26 52

Witness.
Richard T. Dyer.





THE EDISON LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

Take out this patent U.S.

Menlo Park, N. J., ..... 188

Object process of ~~[illegible]~~ Manufacturing Electric Lamps

Invention consists in ~~[illegible]~~ ~~Exhausting the air from the Containing Chamber by means of Charcoal~~ process of Completing an incandescent Electric Lamp first by heating the Chamber Externally Combining therewith a chamber containing an absorbant of gases such as Charcoal, heating the Charcoal to drive out all the gases possible

THE EDISON LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

Menlo Park, N. J., ..... 188

(2)

becomes the Charcoal chamber is connected to the lamp - Connecting the Charcoal Chamber to the lamp while both are hot, The use of a spark gauge to ascertain the state of the vacuum. When sufficiently high the ~~Carb~~ Lamp is connected to the Electric Current & gradually heated by the Current throwing out air which is absorbed by the Charcoal, ~~When~~ the lamp ~~Consump~~ is ~~brilliant~~ brought up beyond the point where it is

3

to be burned regularly, it is allowed to burned for sometime, then is sealed off at X.

The tube C is then affixed to another lamp and the same process takes place. The tube C & rubber joint d might be dispensed with and the mouth of the Charcoal E Extended so as to be sealed on each lime to a lamp.

By this process Vacuum pump Can be dispensed with although in some instances a steam operated Vacuum pump



may be used with economy to ~~after~~ partially Exhaust the globe =

I am aware that Charcoal has been used with a mercury pump (See my other patent). but the operation of Electrical treatment of the incandescent Conduct was done while the Lamp was connected to the pump — The main object of this invention is to save the Expense of a ~~vast~~ great number of pumps necessarily used on account of the necessity of slowly heating the incandescent Conductor

THE EDISON LAMP CO.,

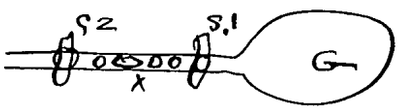
Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

3

Menlo Park, N. J., ..... 188

Dick - Want to get a process patent on this,

Dewar of Scotland got a Vacuum in a Chamber by two stopcocks thus




S S are stop Cocks X the Charcoal. he heated the Charcoal with S1 closed this threw out the air he closed S2 + opened S1 the charcoal absorbed air from G he then closed S1 + opened S2 + heated charcoal again

THE EDISON LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

6

Menlo Park, N. J., ..... 188

but ~~I don't think~~ he never Could get as high vacuum this way as the space Containing the charcoal in manipulating the cox would always keep the Vacuum down a little,

Our device is different, Beside its with a lamp + Electrical heating of the Conductor is another part etc.

~~Of course~~ you can mention drying substances such as Phosphoric anhydride may be used in connection with the charcoal to dry the absorbed the aqueous

# THE EDISON LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

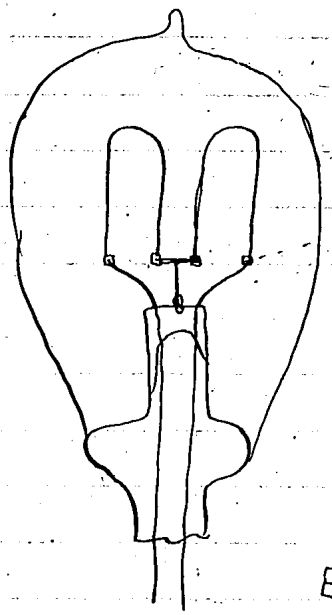
Menlo Park, N. J., ..... 188

Vapor in the Lamp.

T A Edison

January 27 / 1882

Fig 1



Patent 1

plated or alkaline second

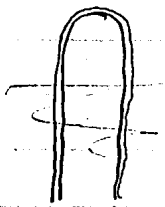
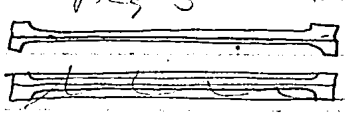


Fig 2

Fig 3



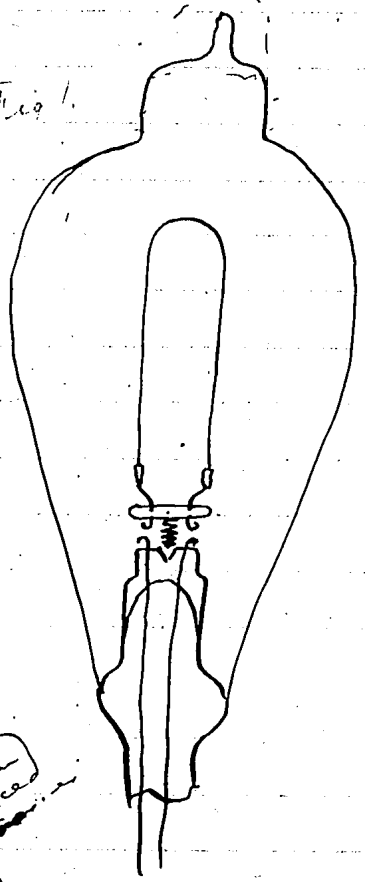
Patent Lamp consisting of two or more separate filiments of Flexible Carbon Cut from the same material and Carbonized together so as to insure same quality as to resistance & economy to permit the two or more filiments to be worked in series. —

Wy. Oct. 9, 08

J. W. Wesley

Patent 3

Fig 1.



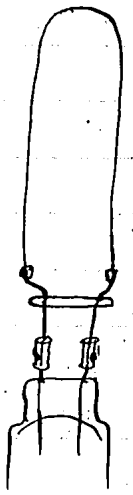


Fig 2.

[redacted]

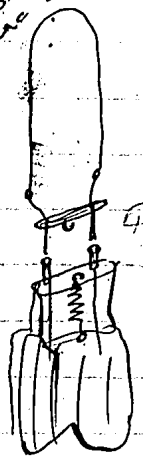


Fig 3

Fig 4

Fig 5

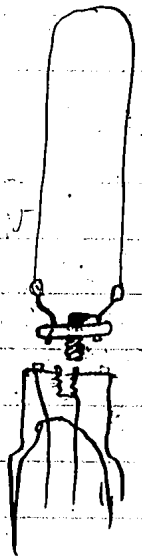
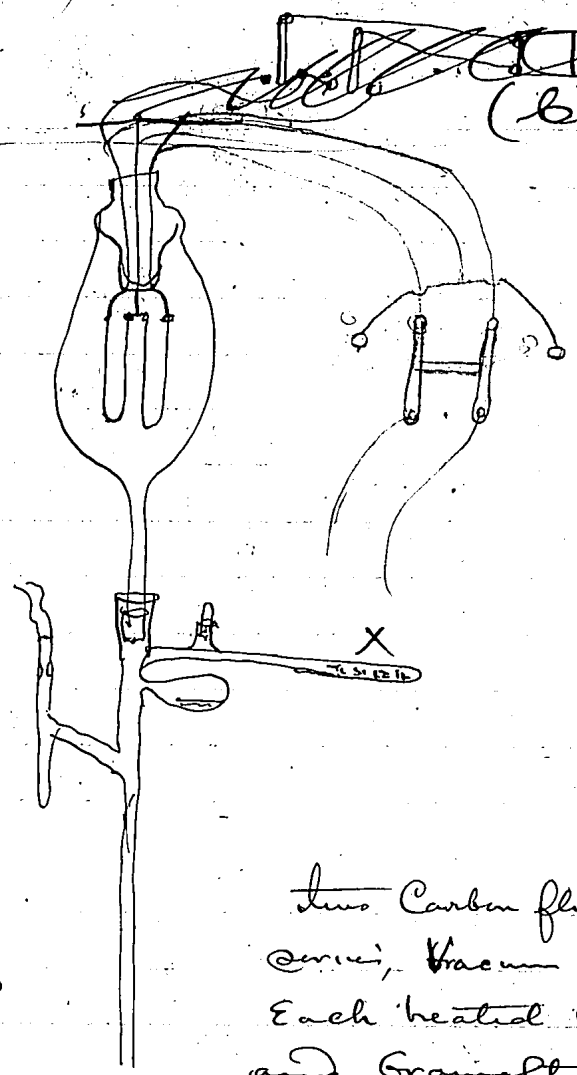


Fig 6

New York Oct. 9. 88

H. Woodbury

(Base No. 509)

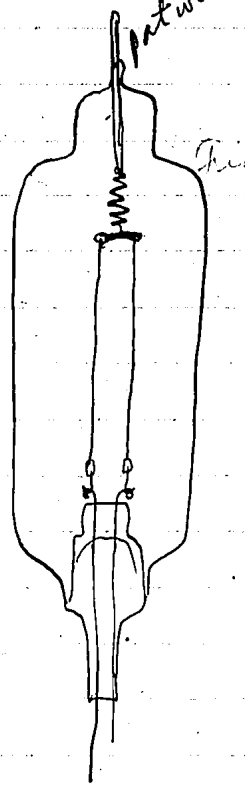


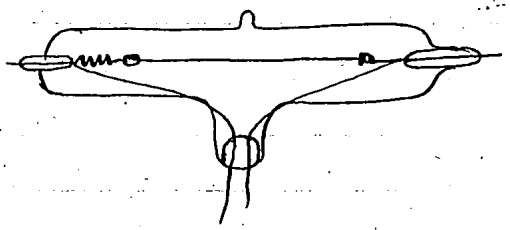

N.Y. Oct. 9, '08
V. L. Wehrly

Two Carbon flix filaments in series, Vacuum obtained. Each heated by Current and Brought up to incandescence seperately, after the air is worked out of each Carbon + Vacuum obtained both Carbons are connected in series and brought up ~~to one place~~ ~~(not 16 Cp)~~ to incandescence. If one is brighter than the other. It may be reduced until its brilliancy is the same as the other, by disconnecting the ~~two~~ + and bringing

The brightest are upto incandescen and heating × which contains Cyanide of Mercury Cyanogen is set free which being decomposed deposits carbon upon the filiments and reduces its resistance, this is done momentarily then the two Carbons are connected in series by a switch & watched to see if both are Equal in illuminating power. if the one that was the brightest is still too bright more cyanogen is set free and deposited & the goes on until both filiments are equal in illuminating power when connected in series afterwards the two filiment are brought upto a greater incandescence than they are affirmed to be burned a high vacuum obtained and the Lamp is sealed off —

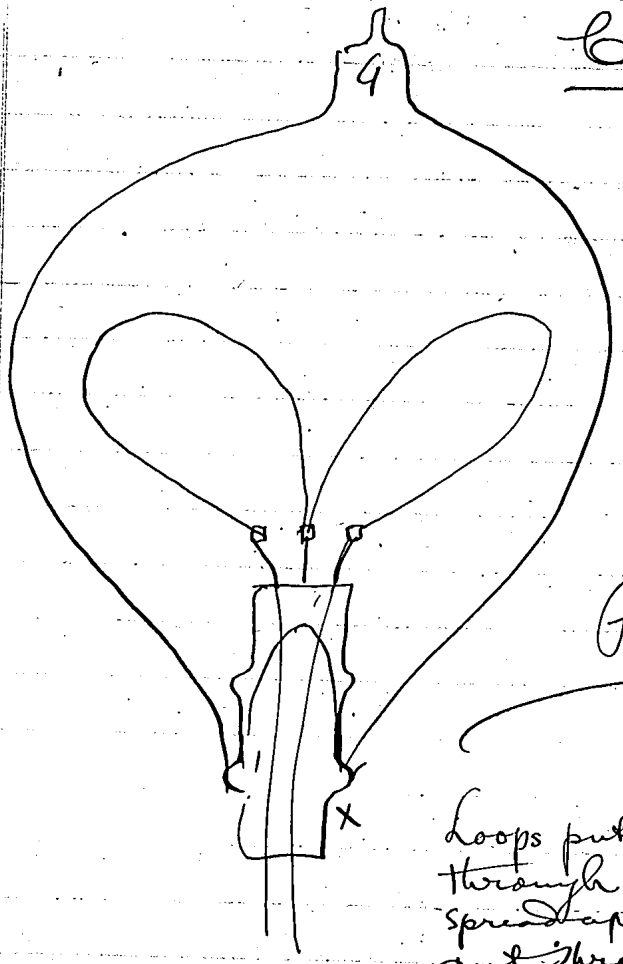
Patent





New York
Oct 9, 82

Case 508




Patent

Loops put together & put through X - afterwards spread apart by a tool put through 9.

New York
Oct. 9 '88

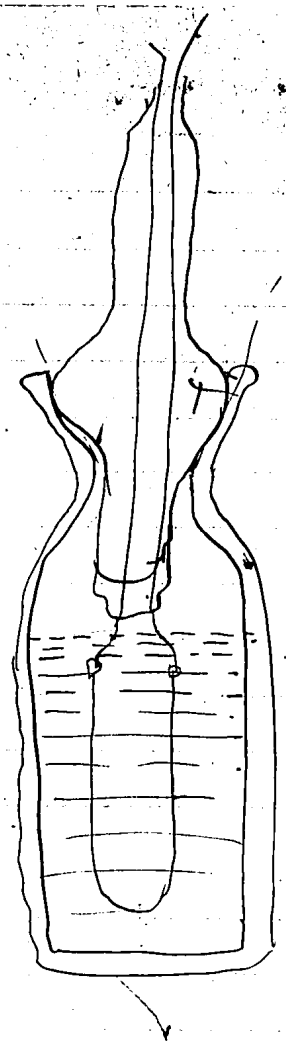
Patent =

~~Treating~~ gelatinizing ~~parchmentizing~~ vegitable fibre by Hydrofluoric acid

The material may be thread paper bombs or athen vegitable fibre in the form of a flexible filument ready for Carbonization or sheets & sheets from which the filuments may be cut or the process may be carried to such an Extent as to Completely gelatinize the vegitable material the gelatine like mass being pressed free as possible of acid & then pressed in sheets by heavy pressure from which the filuments may be cut or punched, no washing of the material is required as Hydrofluoric acid gradually decomposes

Thy

New York Oct. 9. '88
H. W. Geery



Patent 2

gas set free passes out + not falling

Filament is brought up to dull red in the hydrocarbon oil Bisulphide Carbon or other liquid whose gas is not decomposable at a low red heat. This permits of ascertaining promptly if a Carbon filament is perfect before putting in lamp the filament is not allowed to reach a temperature sufficient to decompose in the slightest the gas or deposit anything upon the Carbon if a weak or rather bright or duller spot is seen the filament is not used in a lamp.

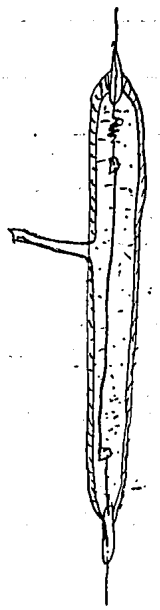
Ney. Oct. 9, '82 Whitney

If it is desired to change the resistance of the filament render it of lower resistance, it is taken out of soaked in sugar or ~~not~~ Carbonizable material not soluable in the menstrum used, and then immersed in the bath and brought up to red heat by the current the sugar or other substance being decomposed and Carbonized within the pores of the Carbon at the same time it is seen that the Carbonization is even for from even spot will be seen & the filament is not used —

Wy. Dec. 9, '82
H. W. Leeds

"Carbon does not decomposition oxide at ordinary temperatures of a Gas-burner vapors

Patent



tube filled with pc filament of Carbon & then packed around it very finely powdered Zirconia, Magnesia, Alumina, Lime or other oxide or even metallic boron & then exhausting the glass by heating the glass by Extraneous source of heat while exhausting the when exhausted the Carbon is spasmodically but to incandescence & then brought up to such a temperature as to melt the oxide in proximity to the Carbon which coats the Carbon with an oxide - the filament is then taken out & burned & globe exhausted & brought to incandescence & sealed from the air to prevent admission of Carbon-thus forming a Carbon-Thus Electric Lamp of Carbon & Oxide burned in vacuo

The Cooling may also be obtained by soaking the filament in an acetate of the oxide & then immersing the filament in a hydrocarbon Liquid & bring it up so as to decompose & set free the acetic acid Leaving Lime upon the Carbon -

New York Oct 9, '80
Edwards

Case 511

Patent

Fig: 1

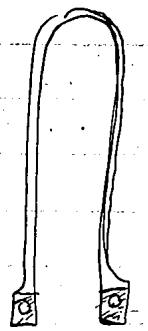
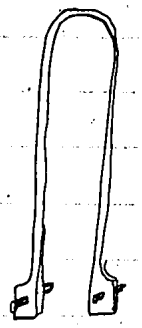
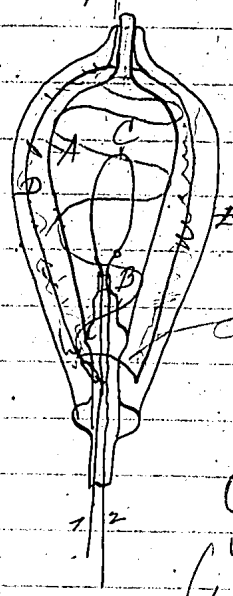


Fig: 2



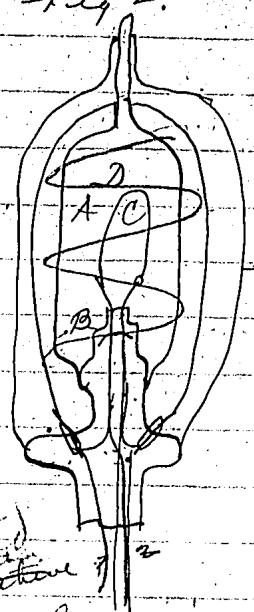
Newyork
Oct. 9, 1900
H. W. Seely.

Fig 1




Run conductor in spiral directly on glass

Fig 2.




Connected with negative

For large carbon

Curves

Vacuum - Charge retained.

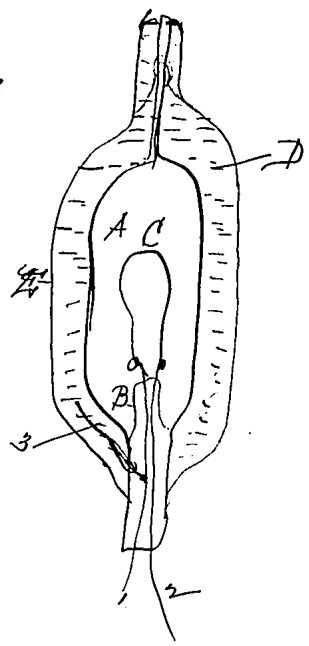
Ex. Carbon positive - Earth negative or zero - Hence glass so - Current makes glass positive - Charges it & Carrying is prevented

Newyork
Oct. 9, '82
Nikola Tesla

Dyer:

Shew this in double globe application

Fig. 3



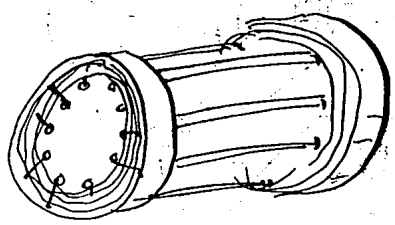

Water,

also Mention that the rapidity of the discharge of the static Current may be diminished by Even filling the globe with, a transparent heavy oil or substance like Canada Balsam, ~~Hard~~ Olive oil the whole of which would be changed by the wire immersed in it -

Ans Feby 16 87

Dyer

Has the ring dynamo been taken out in England

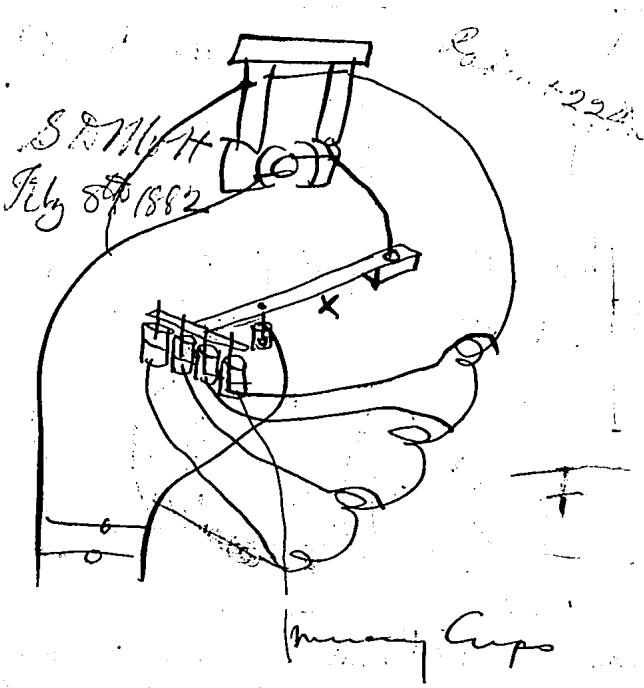


Eng 30
U.S. 333

has the Worm & worm wheel ~~automatic adjustment~~ working on each side with ratchet & pawl of the swinging frame holder been taken out

Both are important -

You have given me no report as to whether I would infringe Brush or if there is any valuable difference between Brush & this one

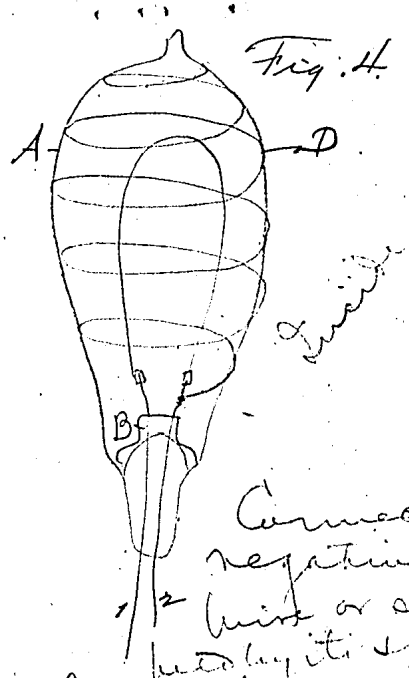



Mercury Cup

X ~~a~~ Expansion strip
heated by main current
passing through =

Flame is brought from
a Potential as Carbon.

Fig: 4.

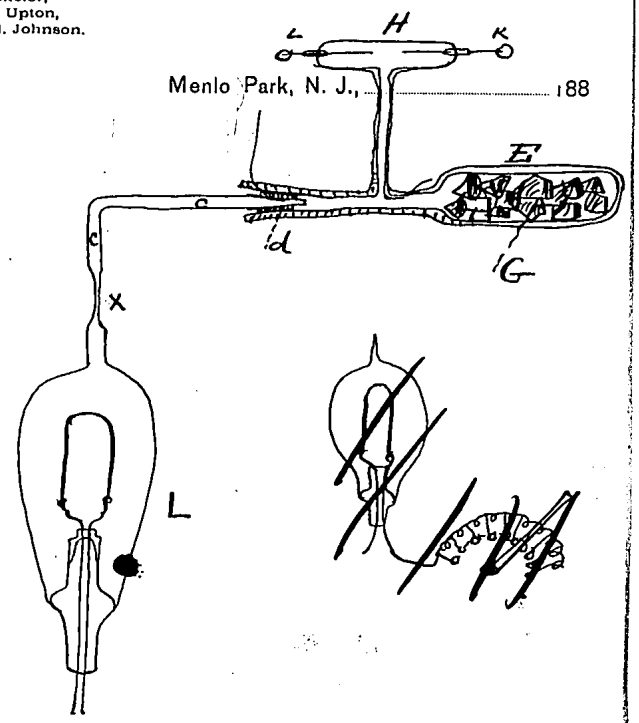



Connect with
negative
wire or sheet
into by its opening
Grid platinum strung
Hydrochloric acid
gas residual
Resists electrical
Carrying
Exhausted by hand-
pump - they gas accumu
to Carbon in a

February 1882

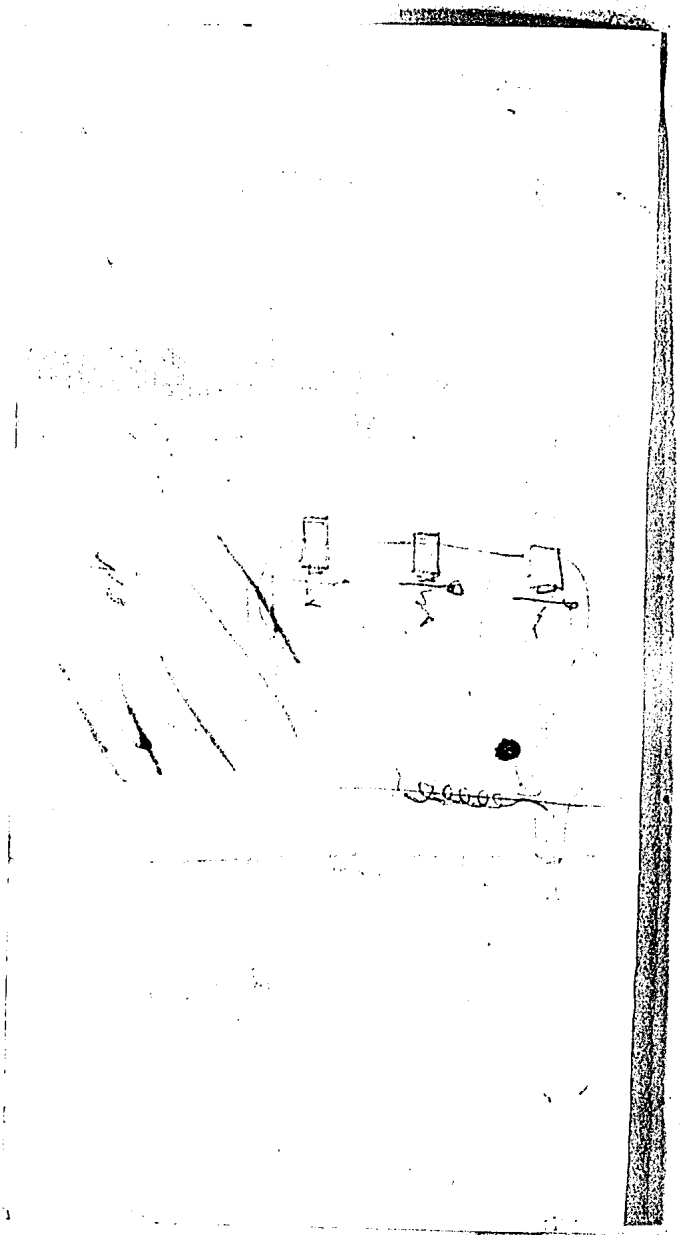
# THE EDISON LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

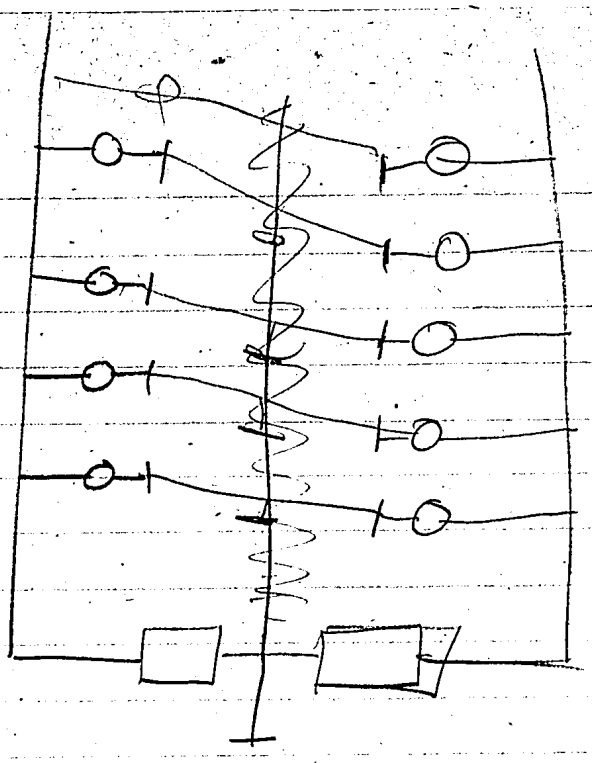


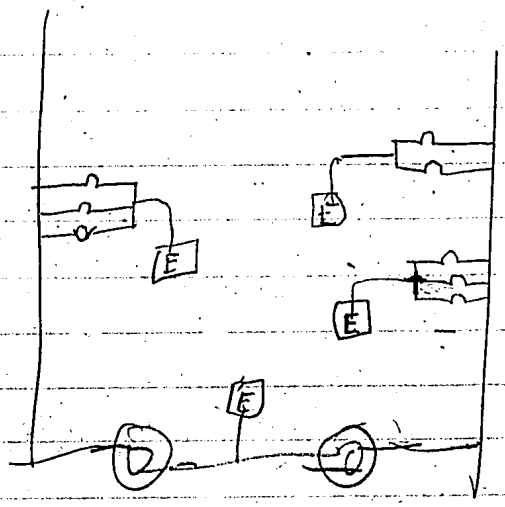

S. L. Wood
Feby 8th 1882

February 18



Patent Extension Ref. Dyer

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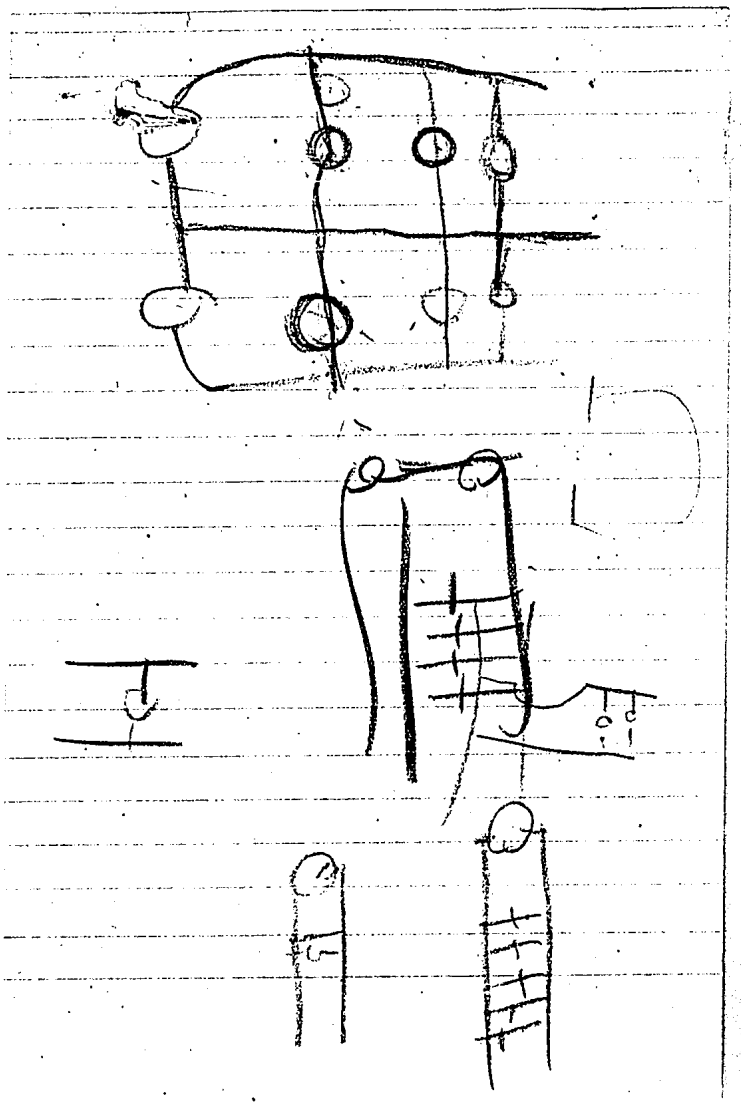
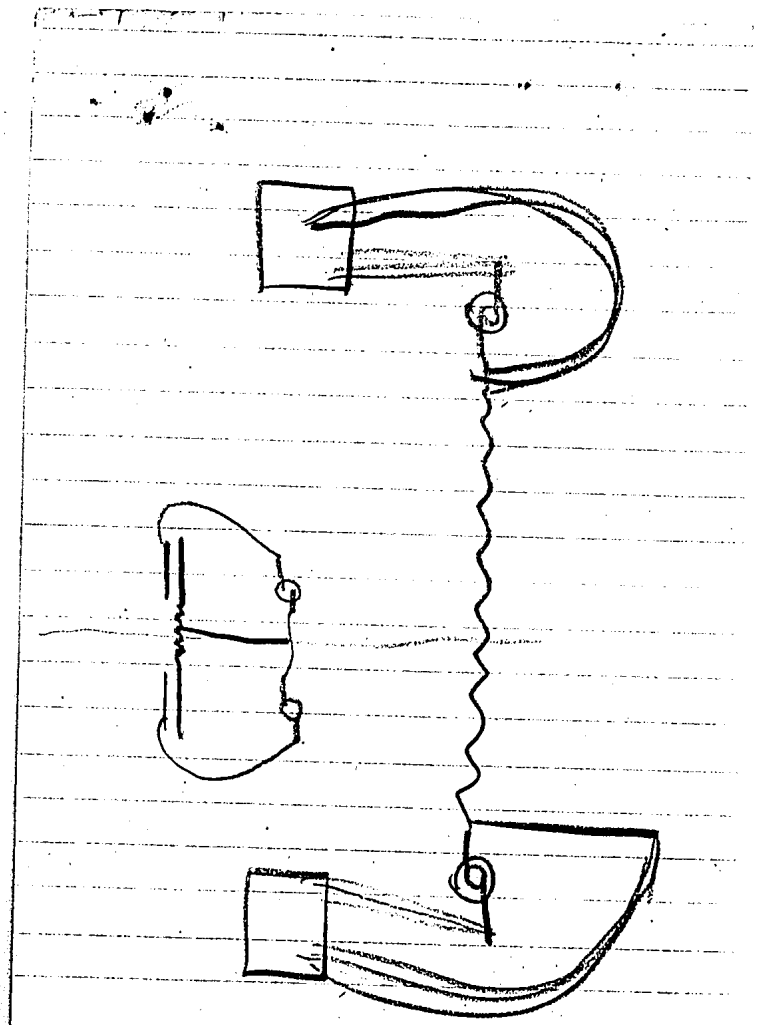
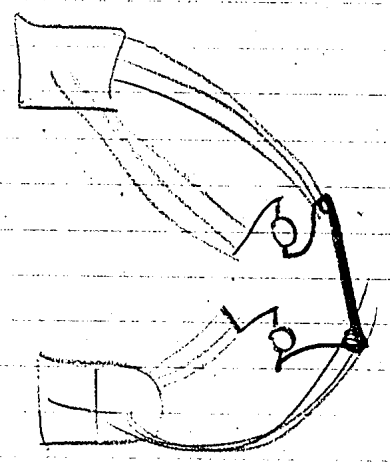
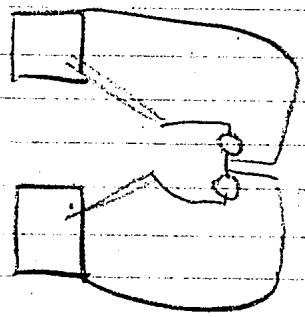
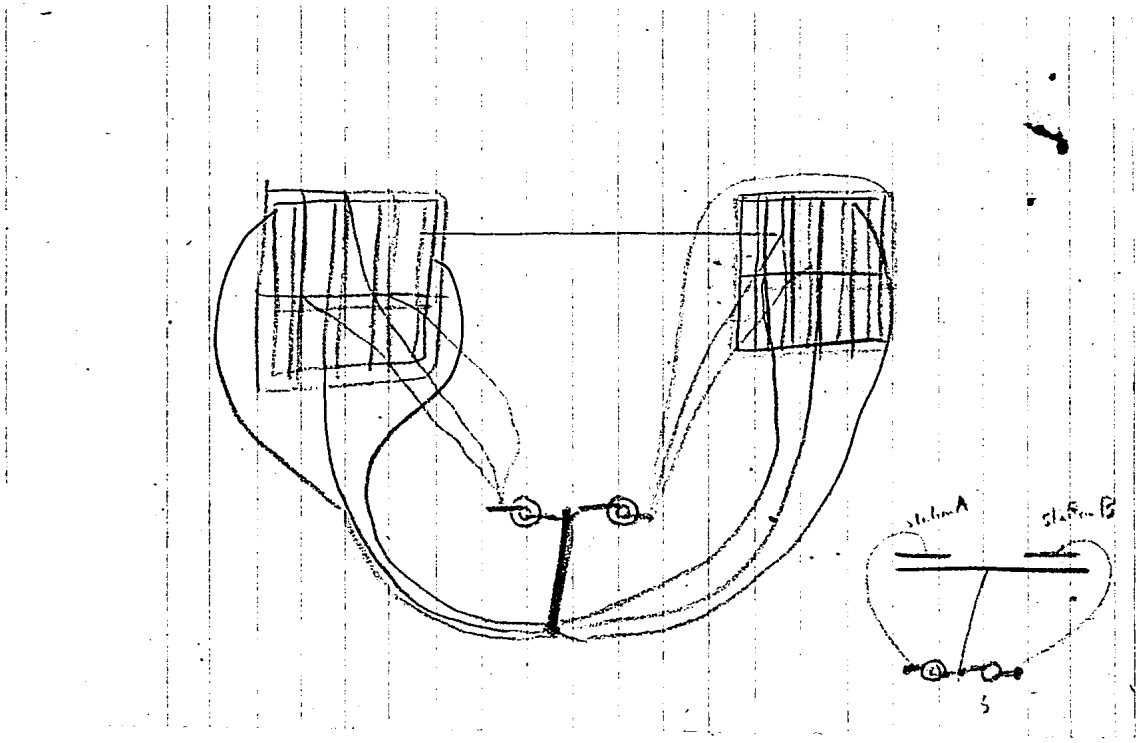
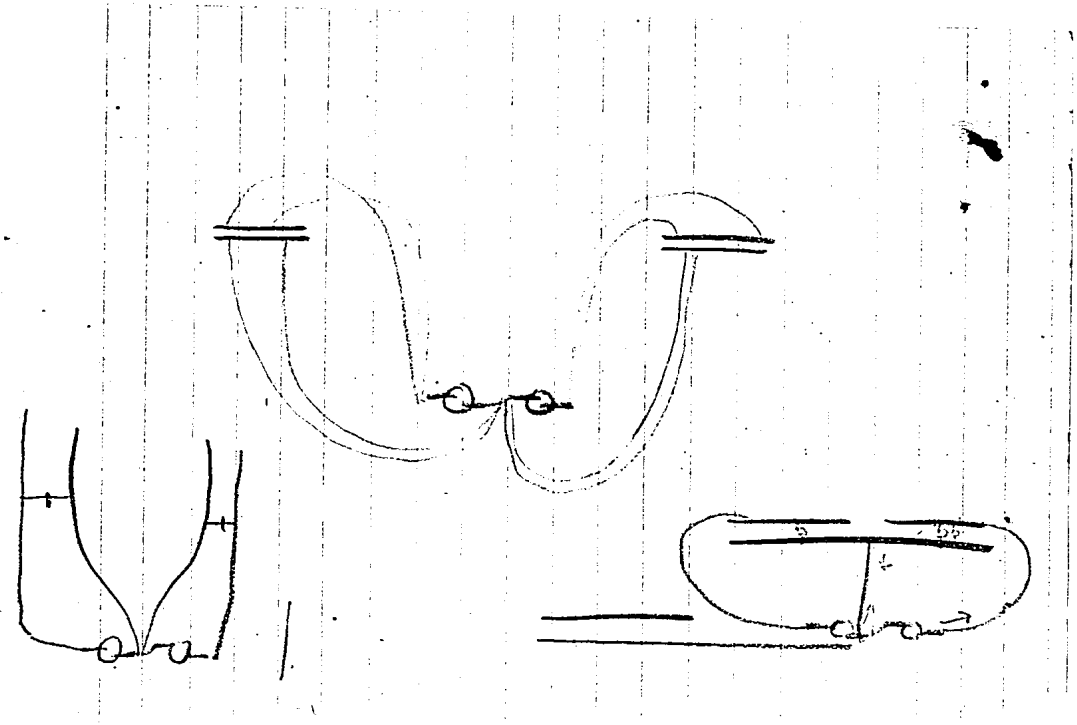


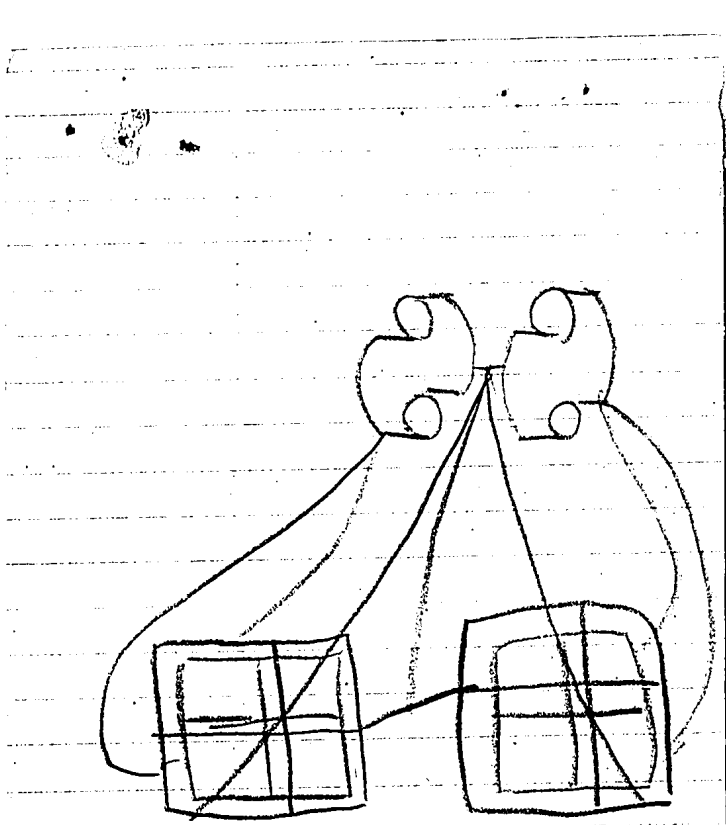


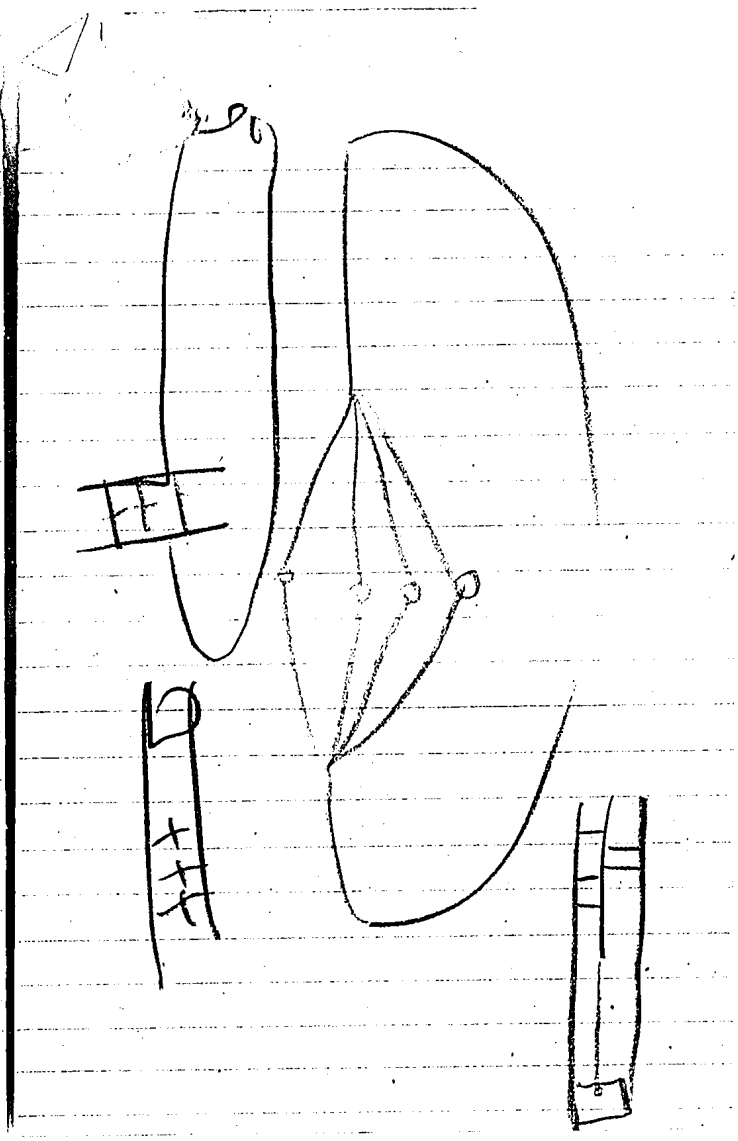












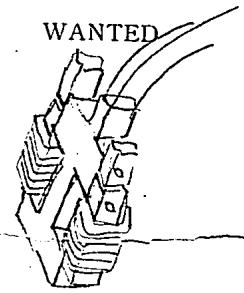
Form No. 22. 4, '81—1,000.

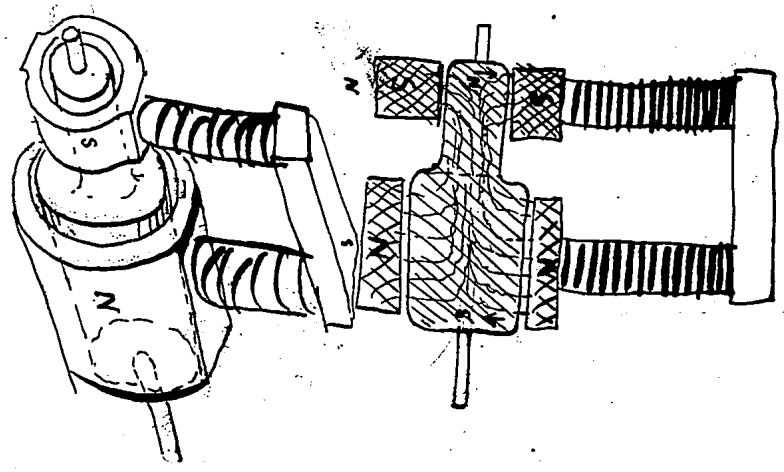
NO.

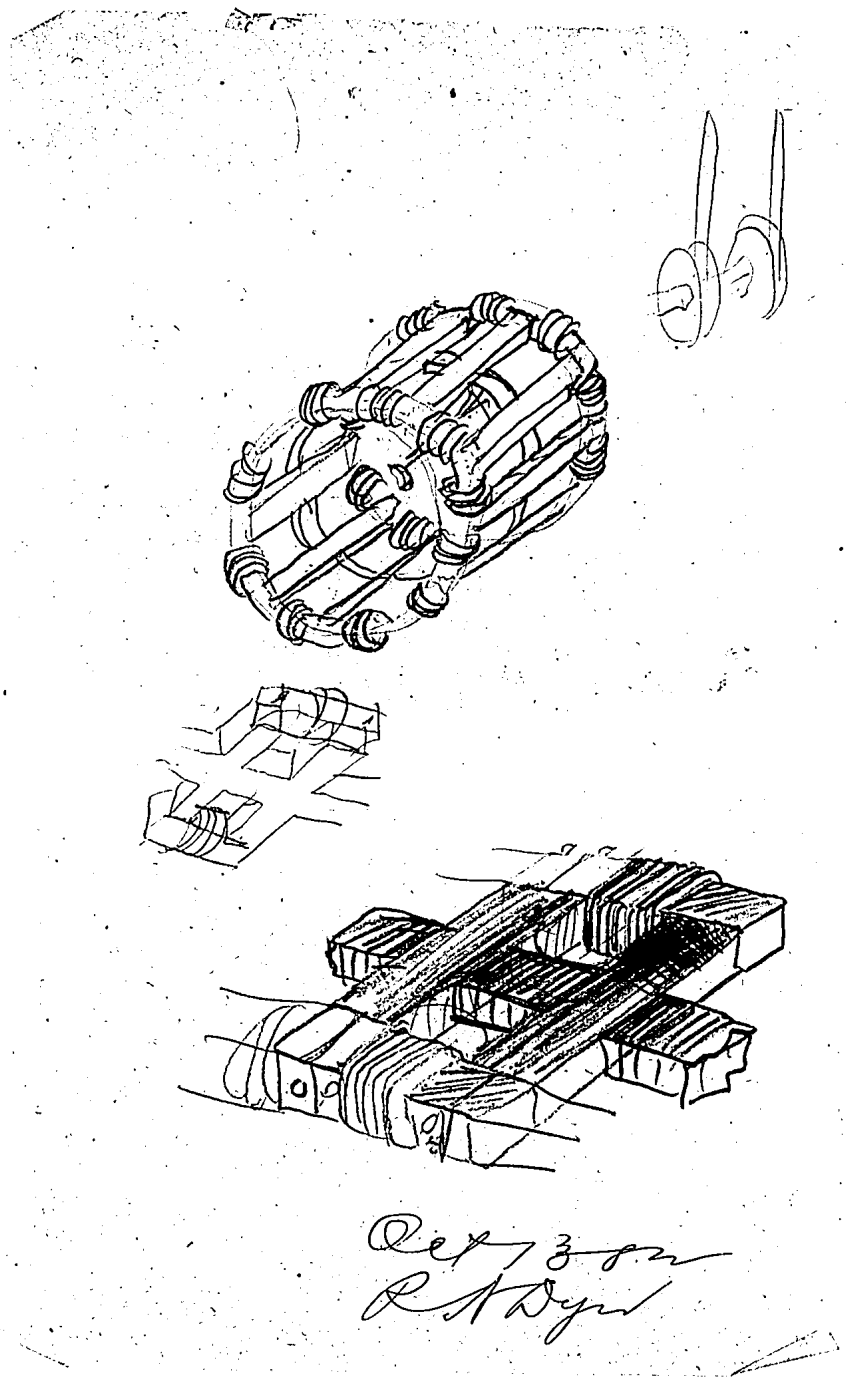
LOCALITY

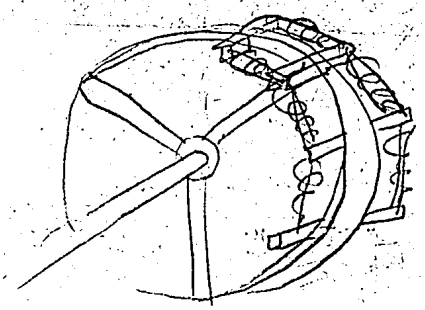
APPLICANT

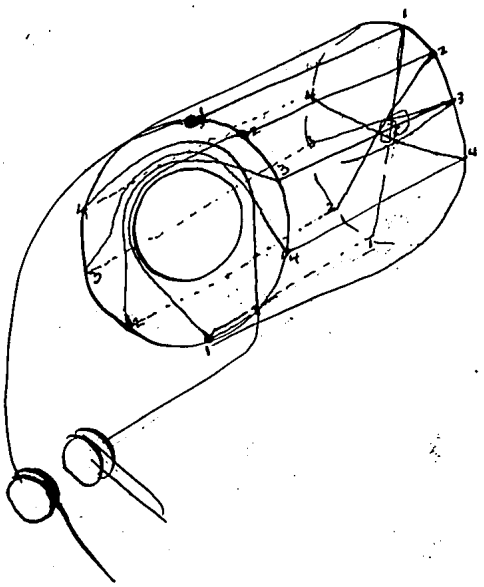
WANTED



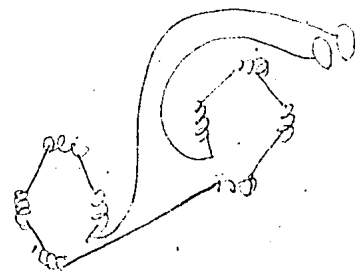


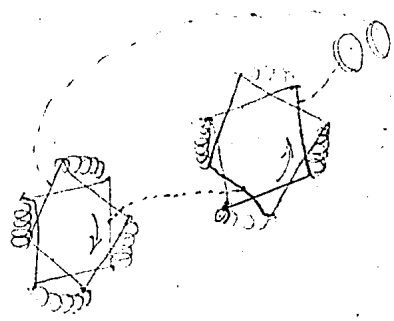




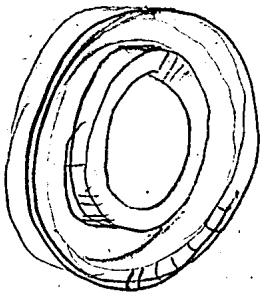


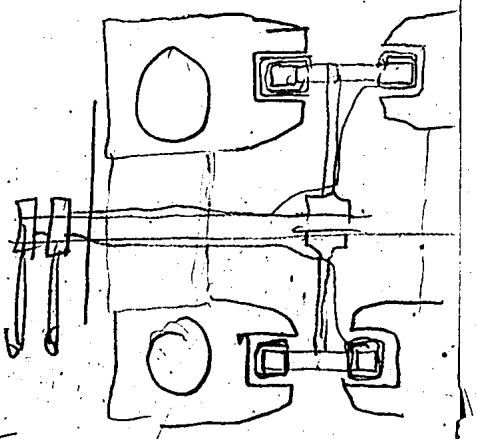
Oct 13 '82
R.A. Dyer



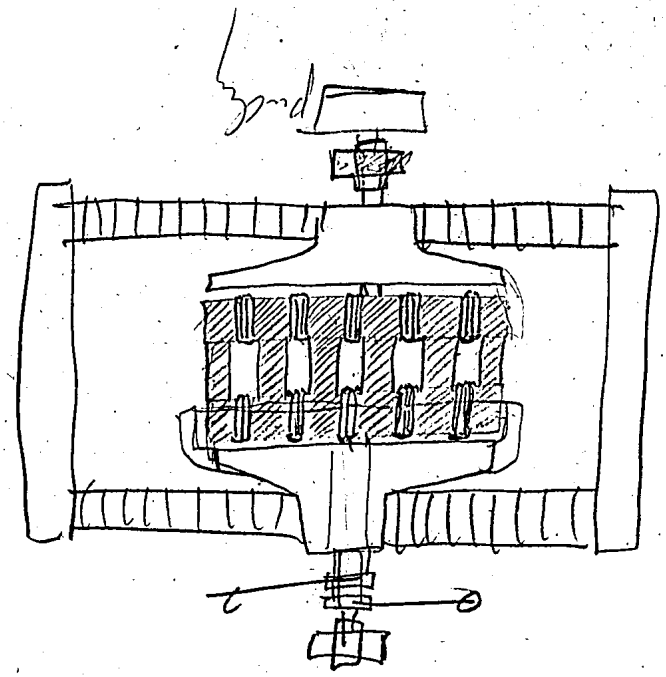


Oct 13 '82
R.A. Dyer

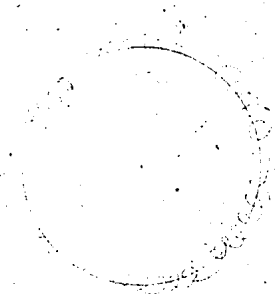


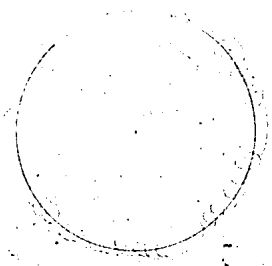


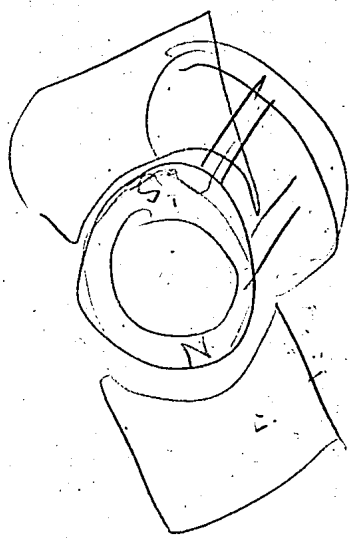
Oct 3. 8m
R.N. Dyer



Oct 3. 8m
R.N. Dyer



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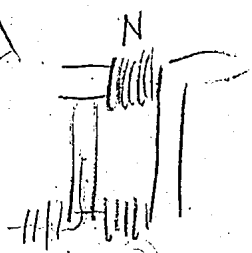
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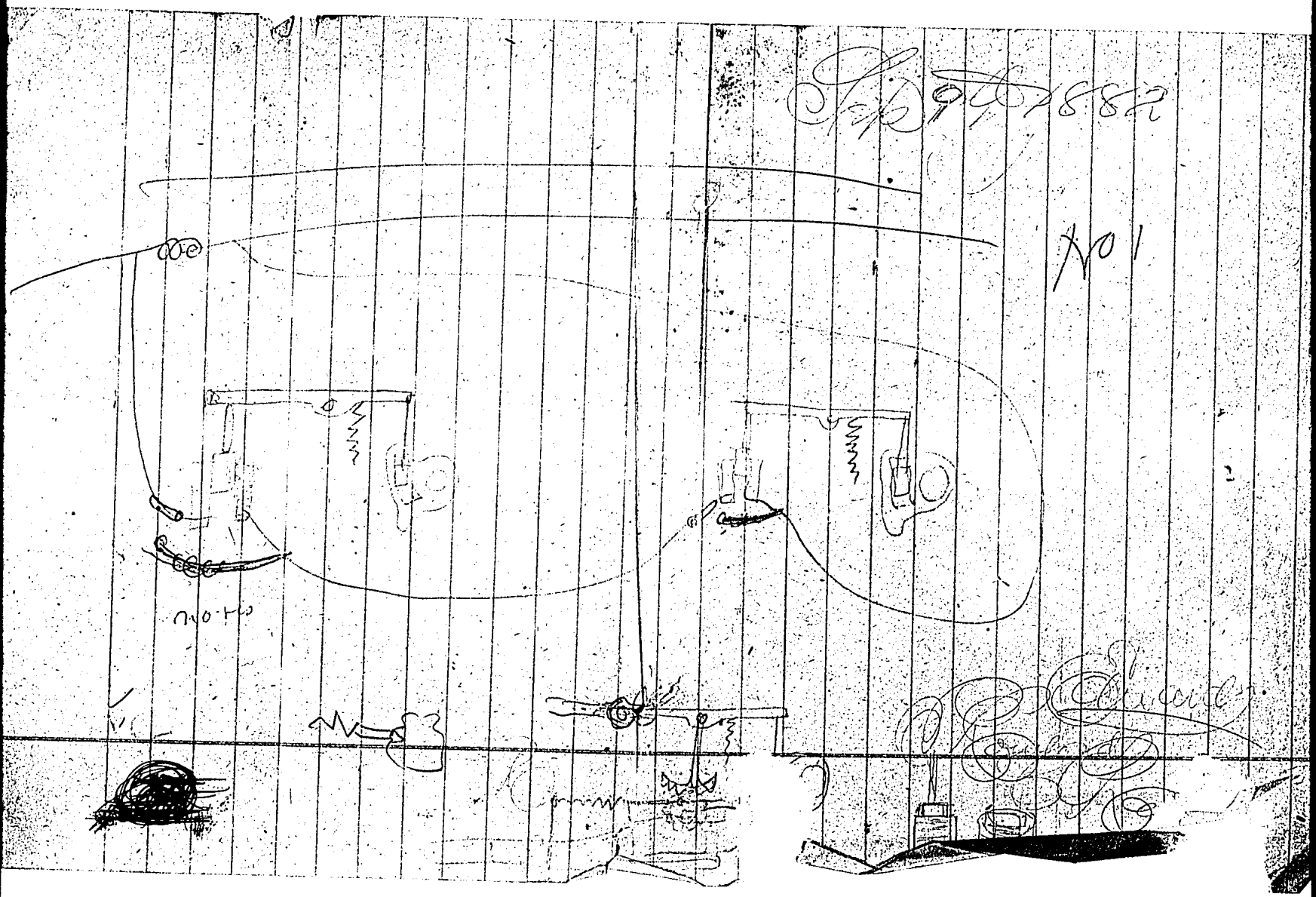
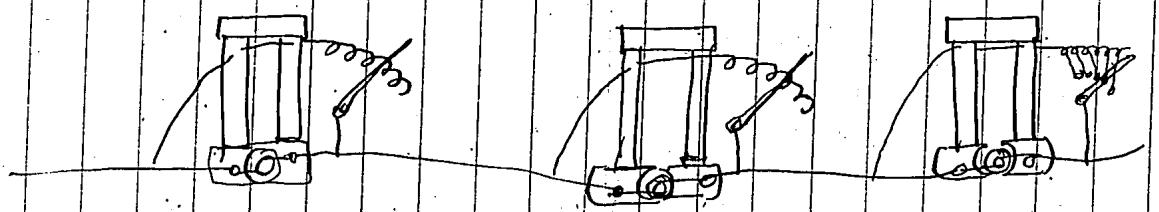


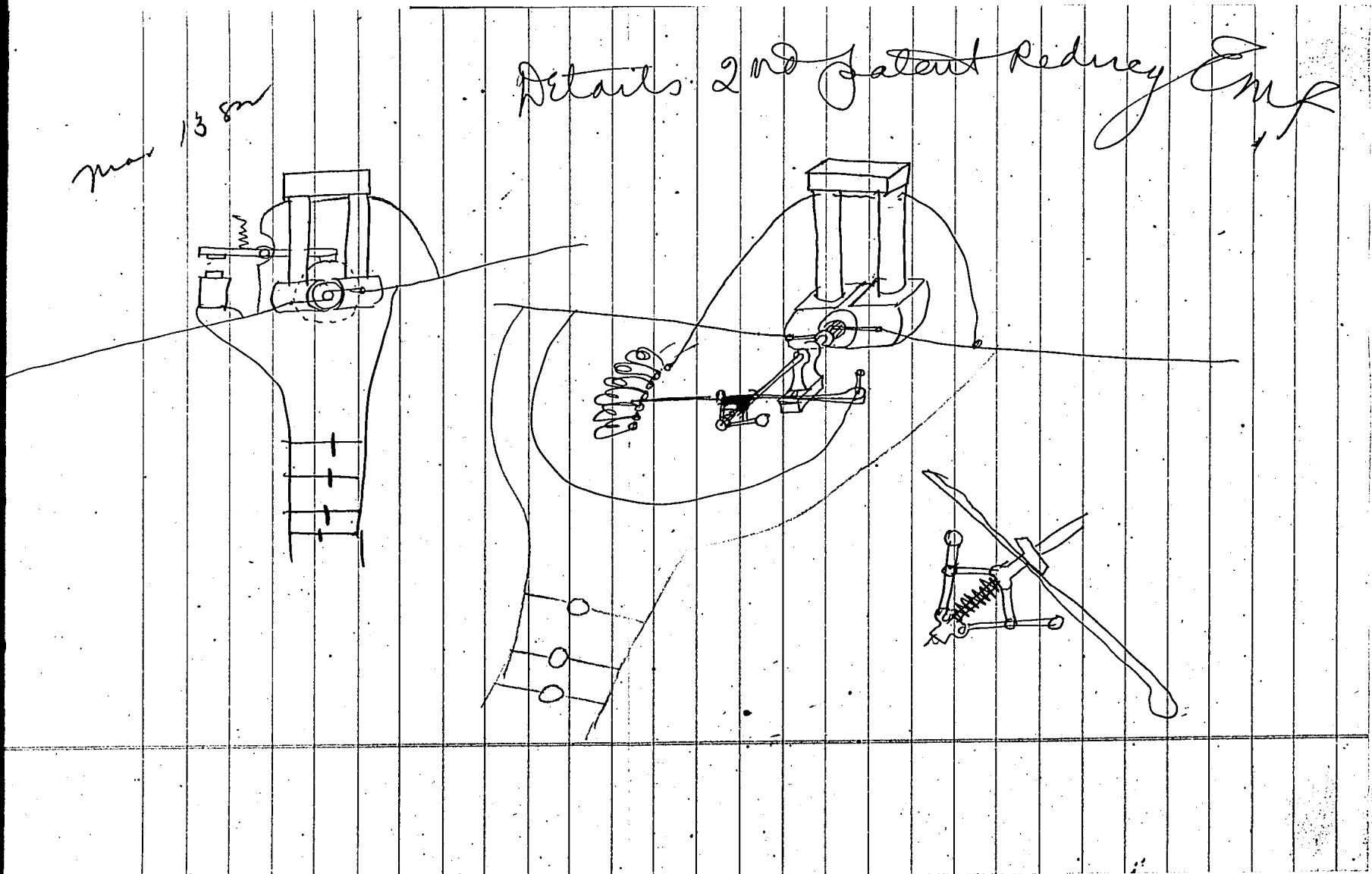
Mar 13 8m

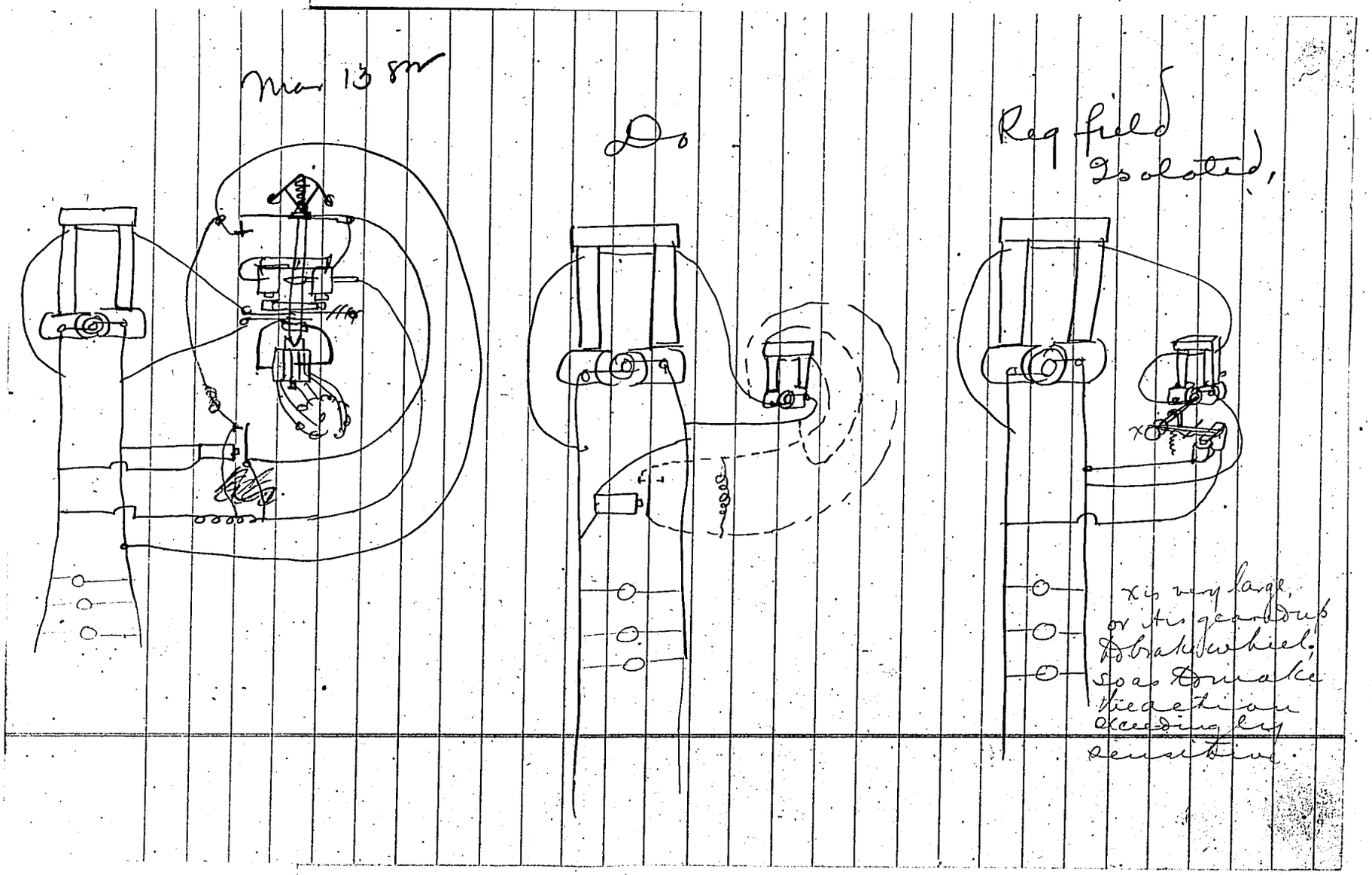


Patent several Dynamos worked
Either as generators or motors
all in series Each having its
own field multiplied and armatures with an adjustable resistance
in the field so that Either or each can be adjusted
separately -

Mar 13 8m

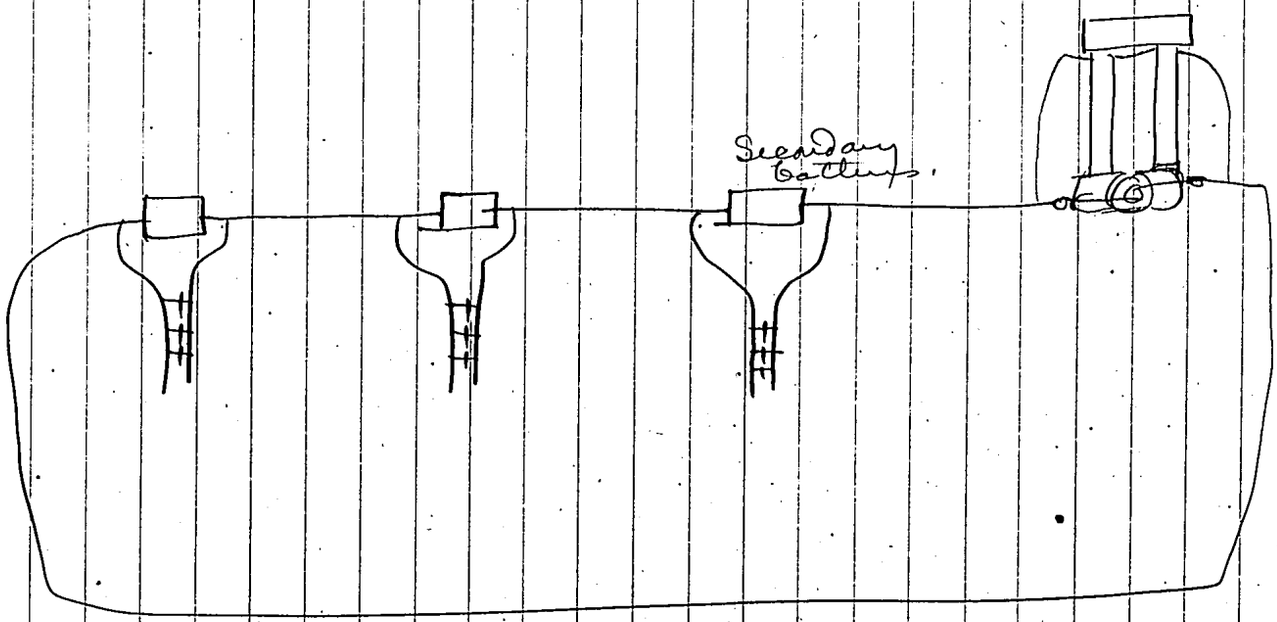
Details 2nd Patent Pedrey Emf




Mar 13 8vo
Do
Reg field
Isolated,
x is very large,
or its coordinate
to brake wheel;
so as to make
the equation
exceedingly
sensitive.

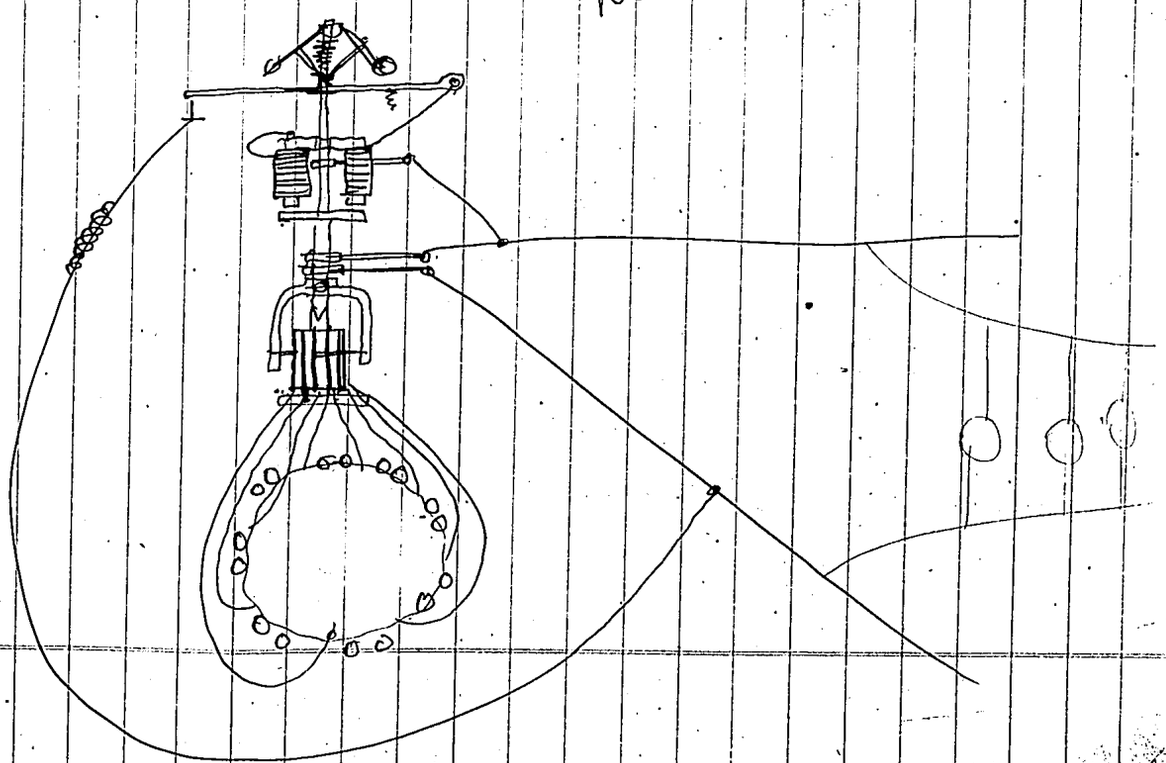
Mar 13 8vo

2nd patent Ends (Details)

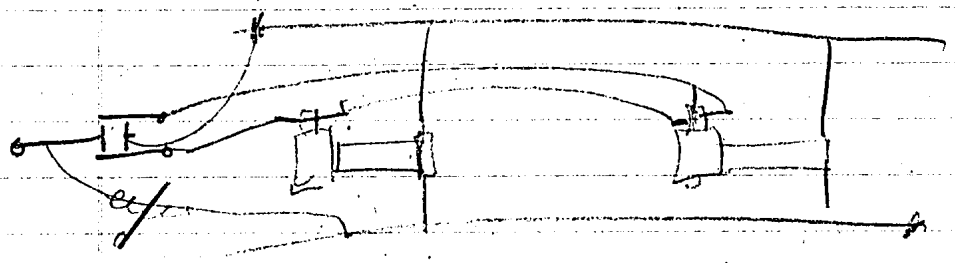


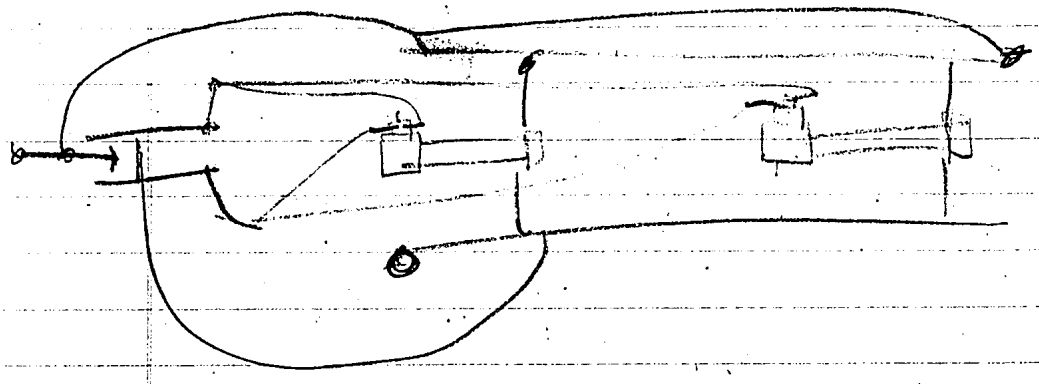
Mar 13 8m

Detail 2nd Enf Patent



Mar 29th 82





Immunism consists in effecting the Economical decomposition of various substances Electrolytically by submitting such substances to Electrolysis when under high temperature.

~~Now~~ found that many substances

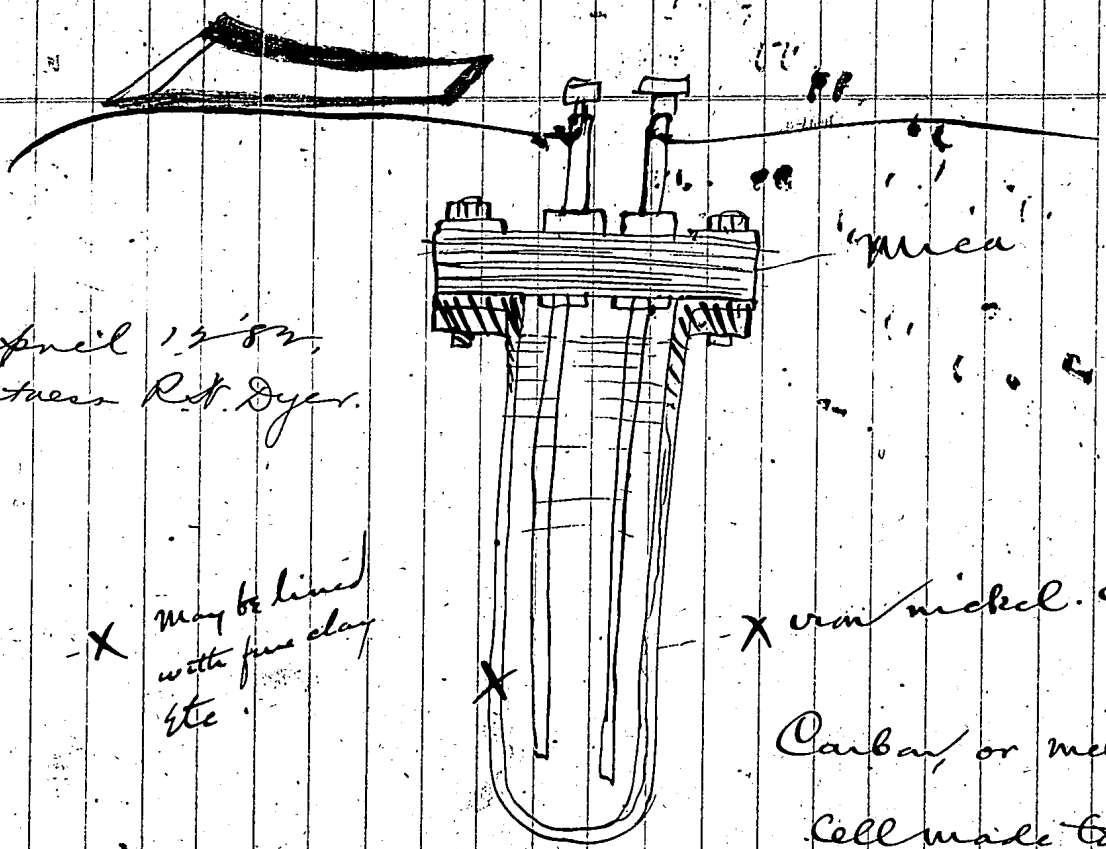
Heat tends to diminish the amount of Electric Energy required to effect the decomposition, and as this heat is obtained directly ~~from~~ from the Combustion of fuel acting on the substance the process requires but a small amount of Electric ~~Energy~~ ~~still also the~~ and this amount is still further diminished by the fact that nearly all Compounds diminish the resistance by heat. The more particular object of this invention is to act on substances which do not conduct ~~at~~ at all at ordinary temperatures ~~but~~ just conduct sufficiently at very high

temperature to permit of decomposition of the carbonates and liquid at a low temperature thereby to allow for effecting the decomposition must be such as to permit of high pressure

Claim:

A cell for electrolytic decomposition

The



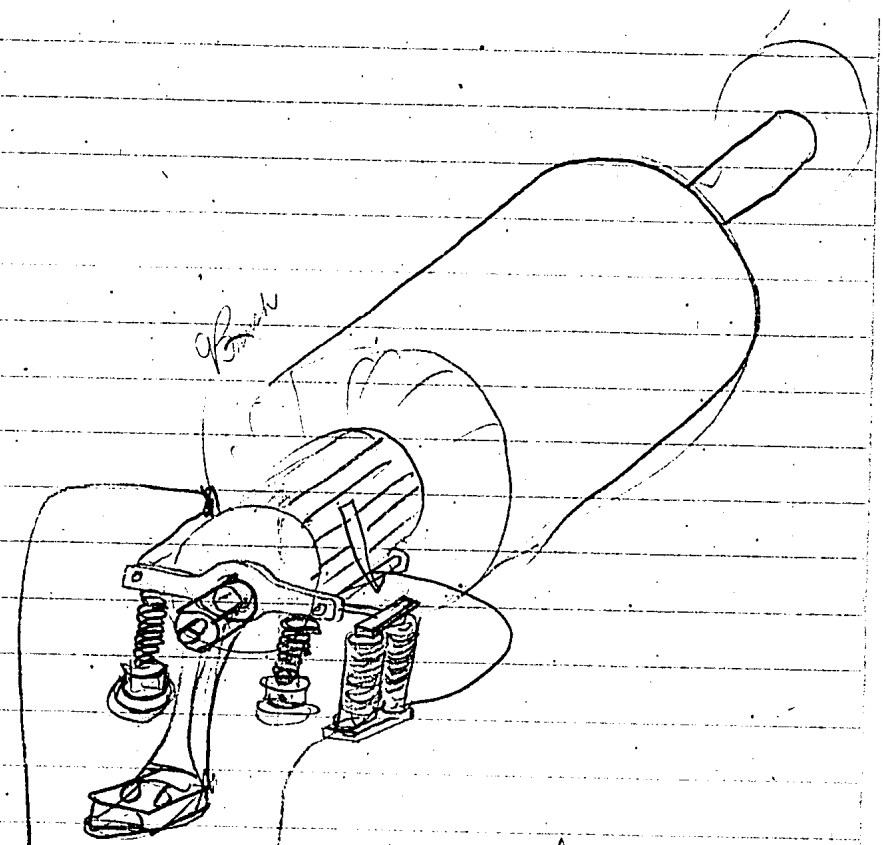

April 1, '82,
Witness R.F. Dyer.

X May be lined with fire clay etc.

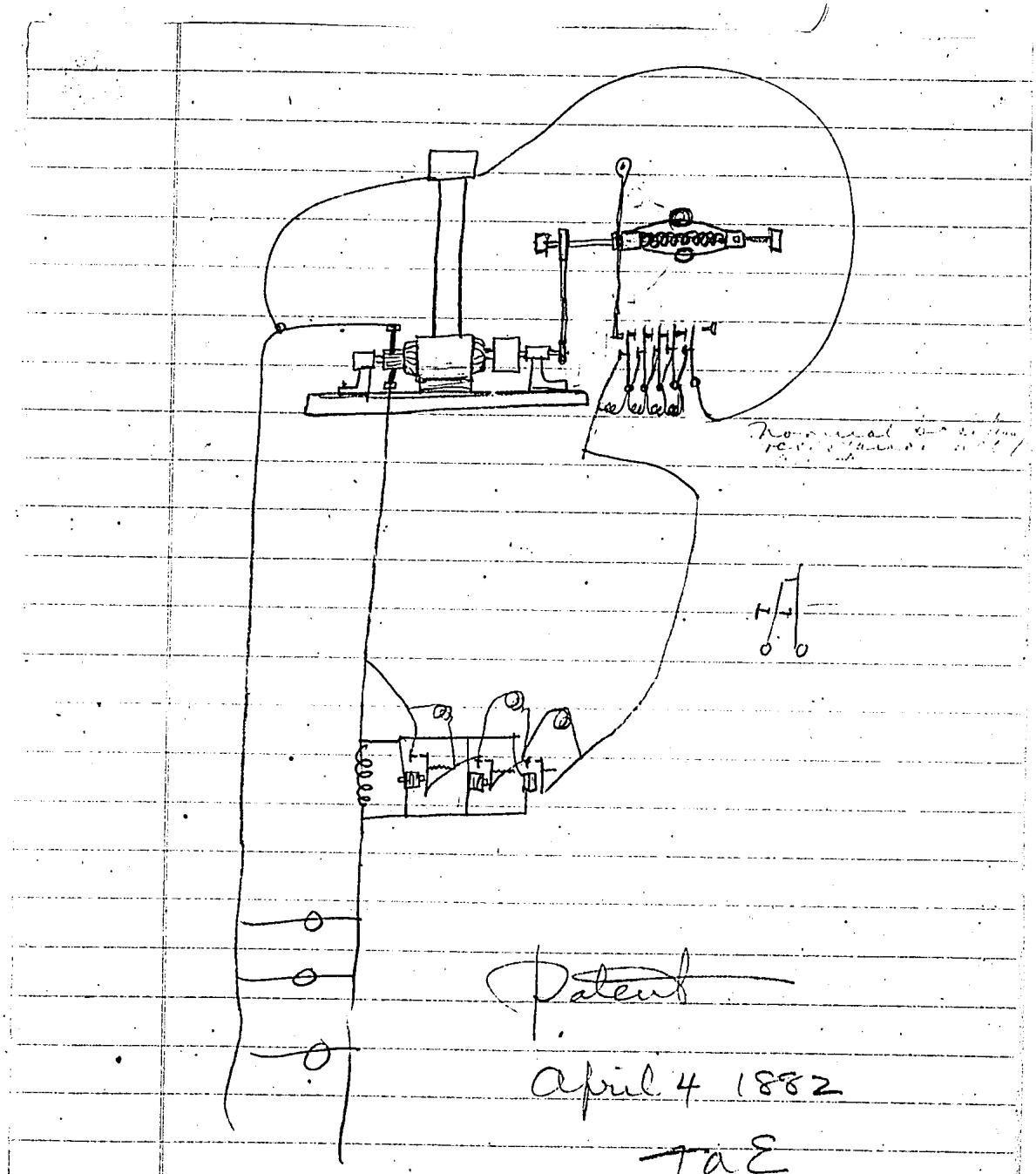
X iron nickel cell.

Carbon or metallic Electrodes.

Cell made to withstand several hundred lbs pressure to sq inch



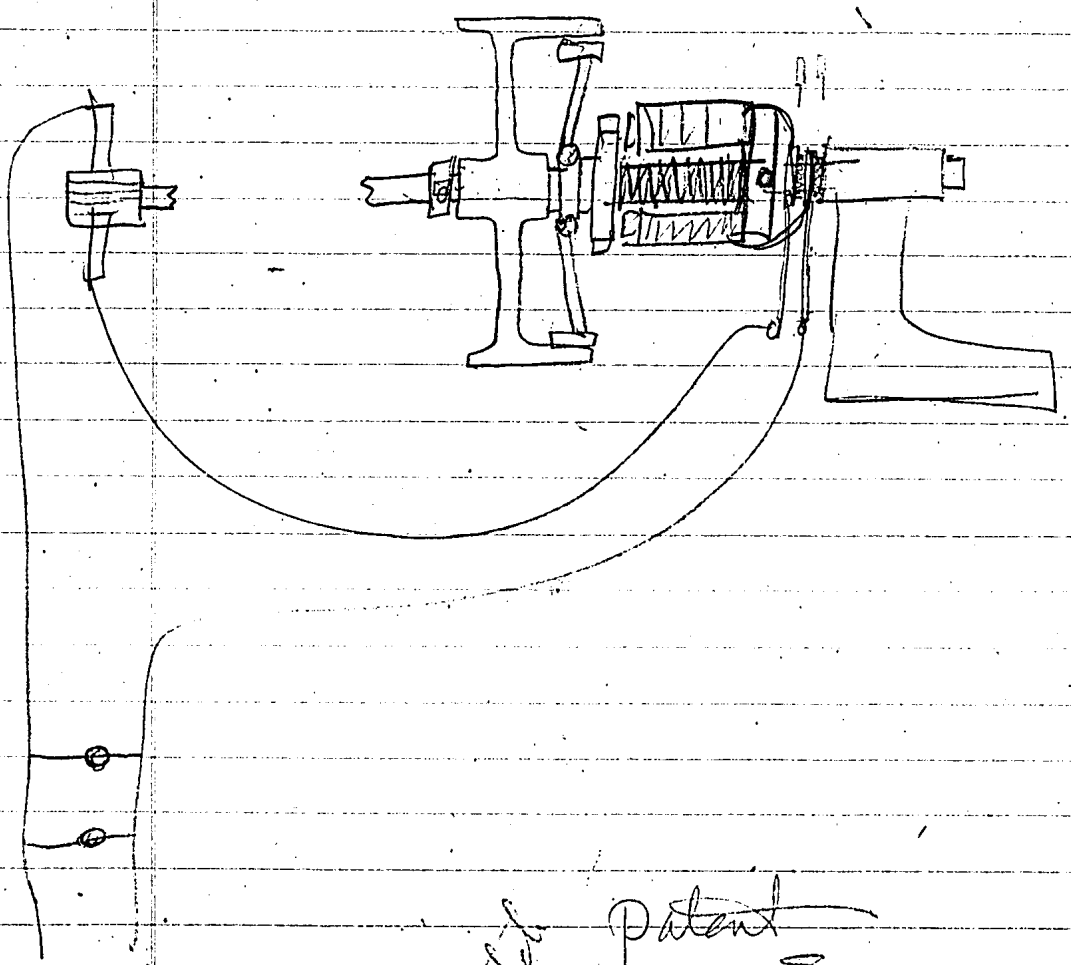
Patent
April 4 1882
T & E



Patent

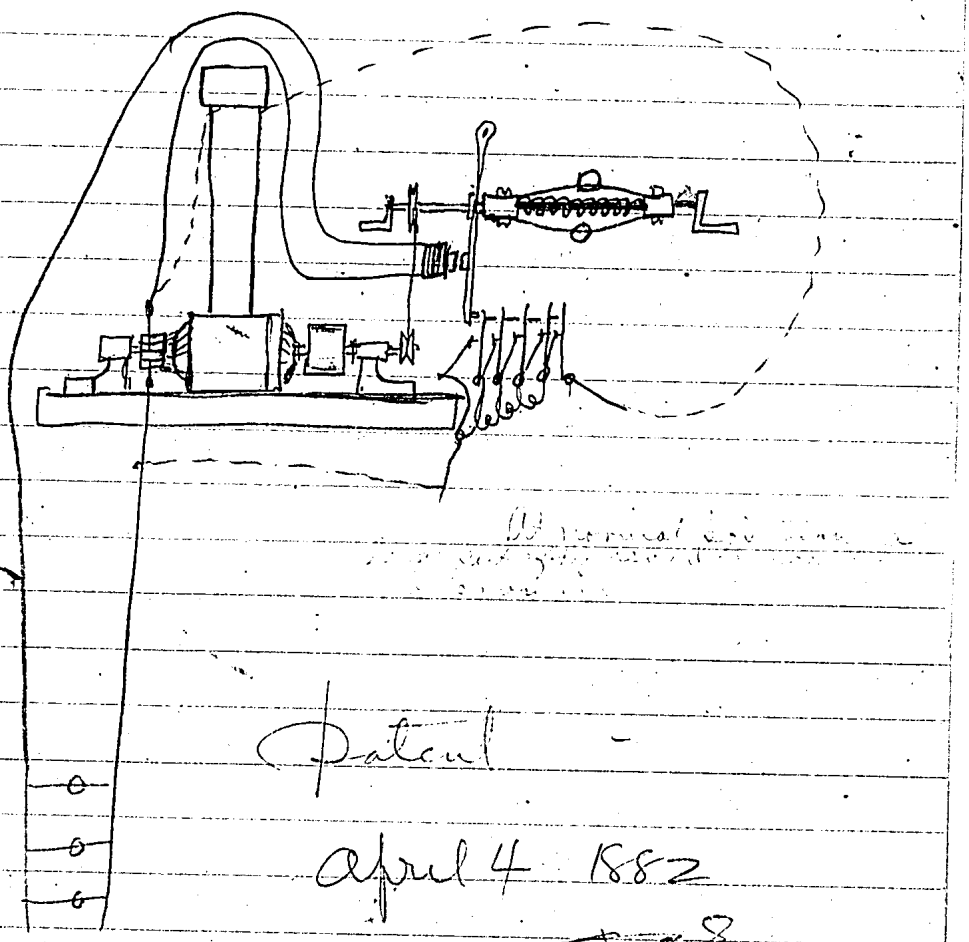
April 4 1882

TAE



Mann Edison Patent
No 255
April 4 1882

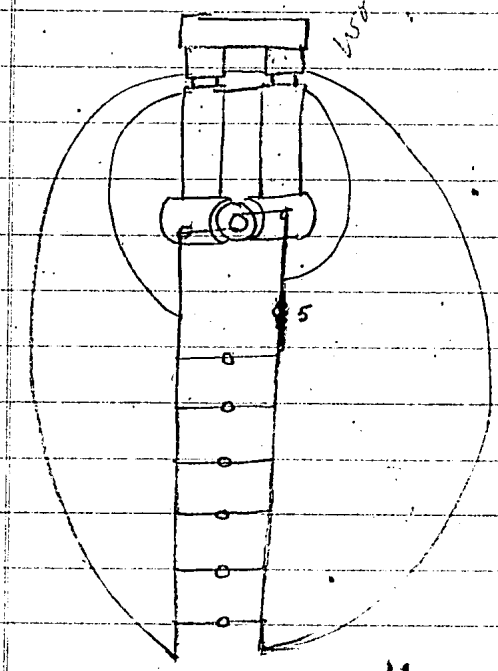
Make Drawing with 3 sets of resistance in.



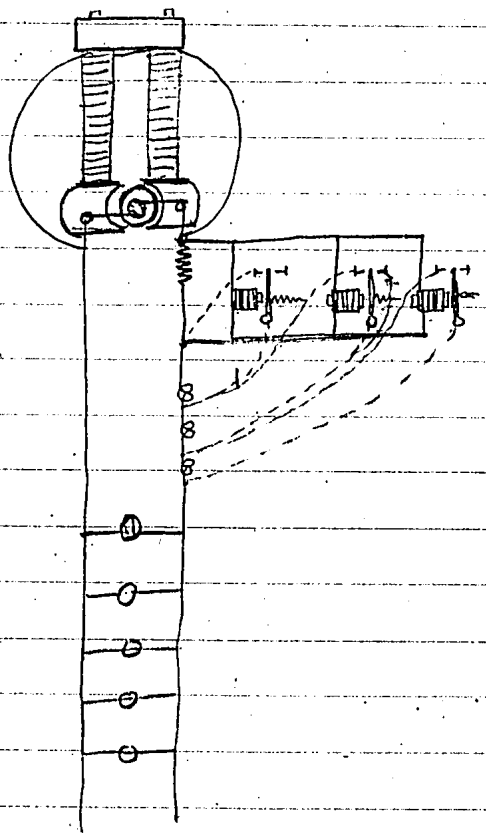
Patent -

April 4 1882

Taft




Drop anticipated. If no sufficient
drop a resistance can be put in



1882

April 4. Patent

TAE

Englewick N.J. U.S.A.

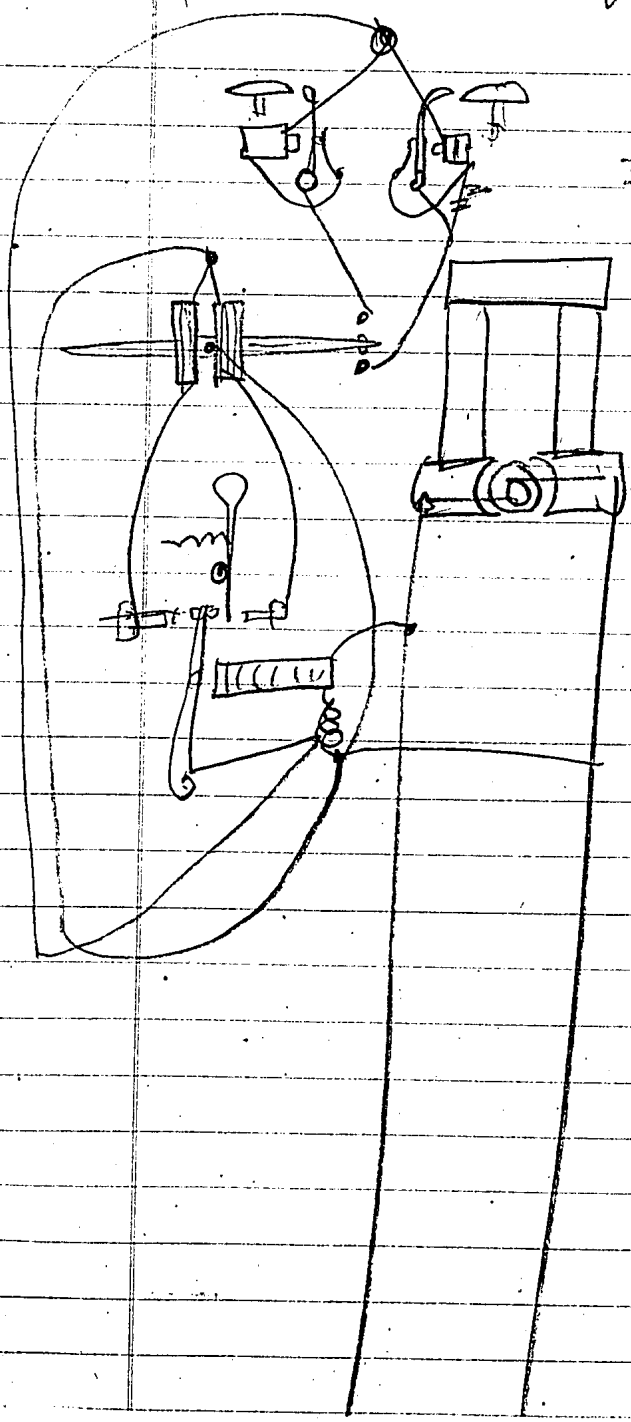
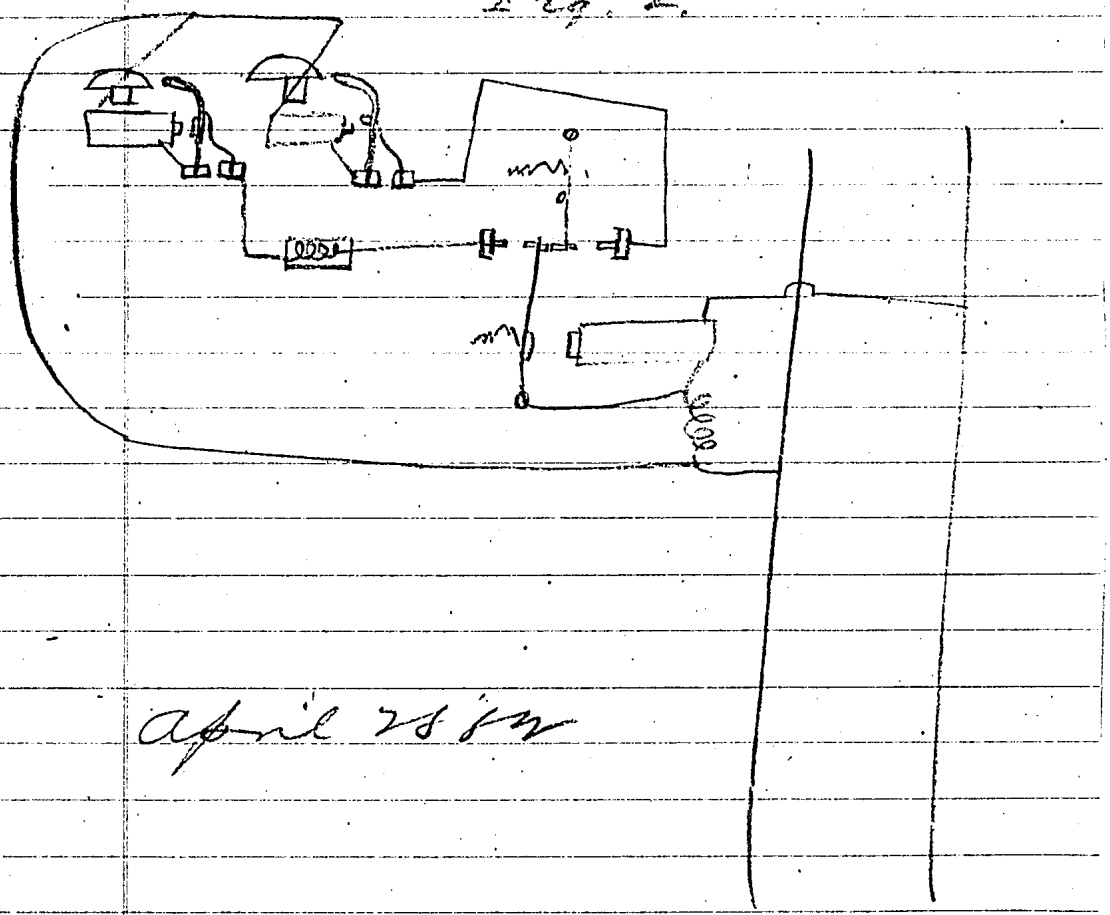


Fig 4.

April 28 82.

English No. 43

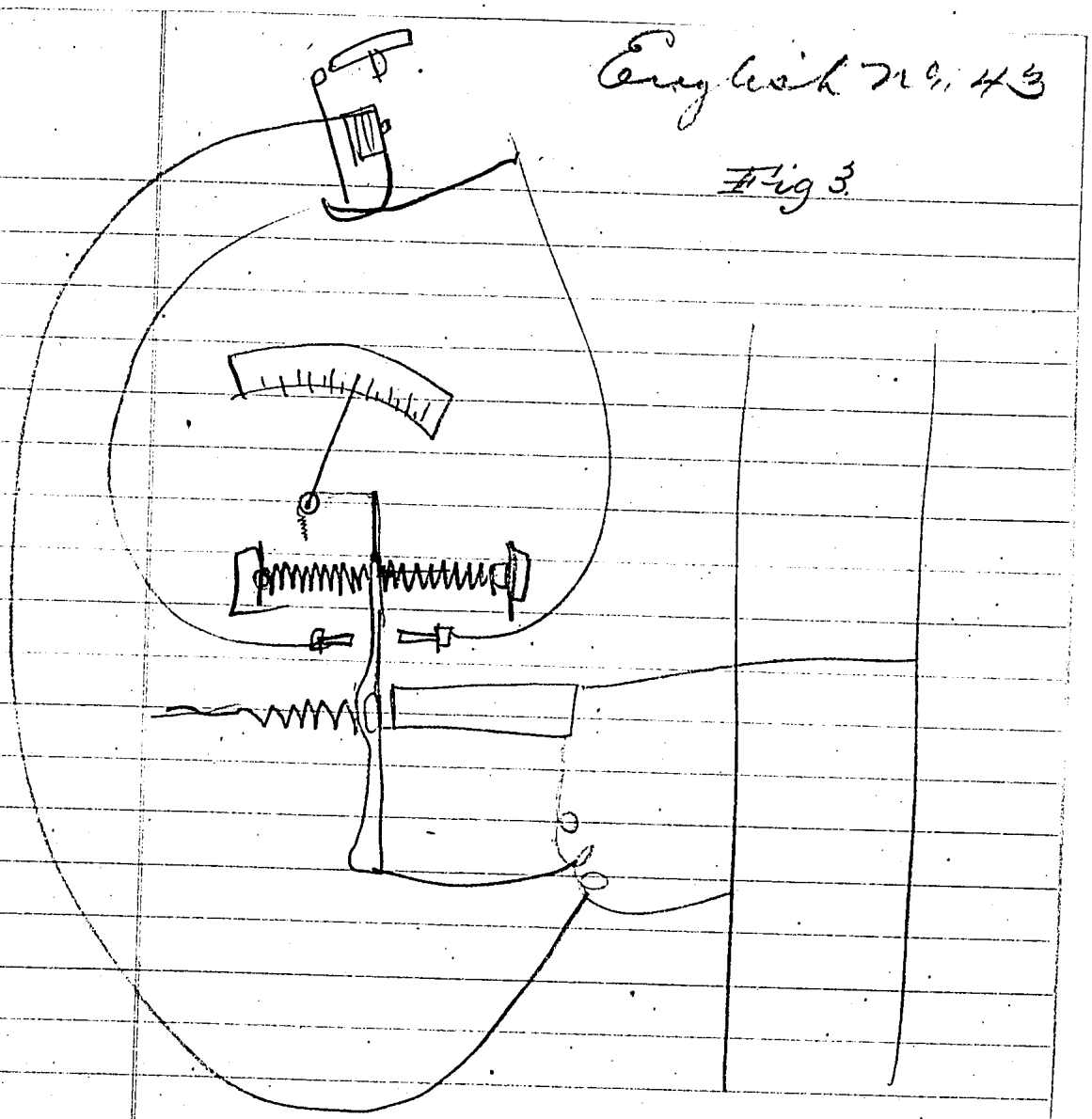
Fig. 2.



April 28 th

Eng. Lab. Fig. 43

Fig 3.

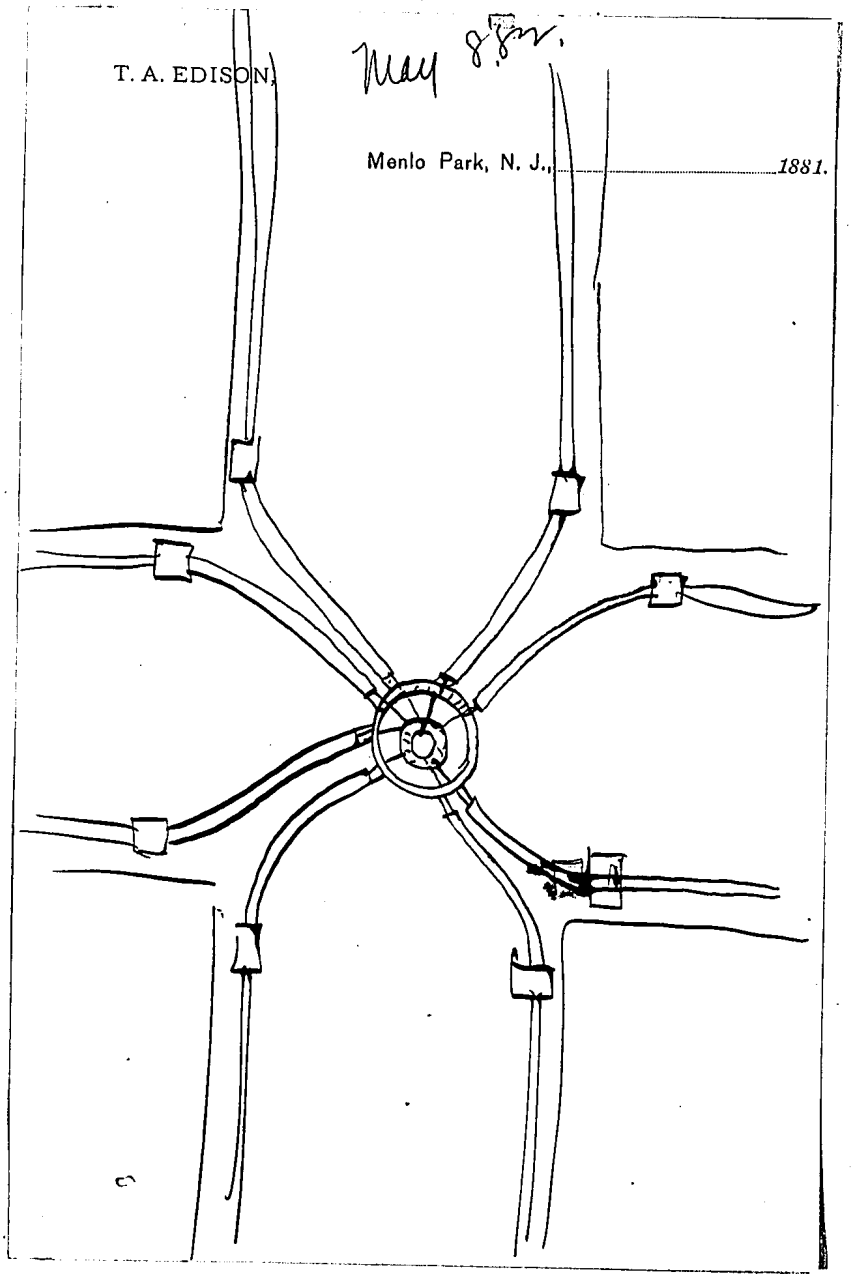


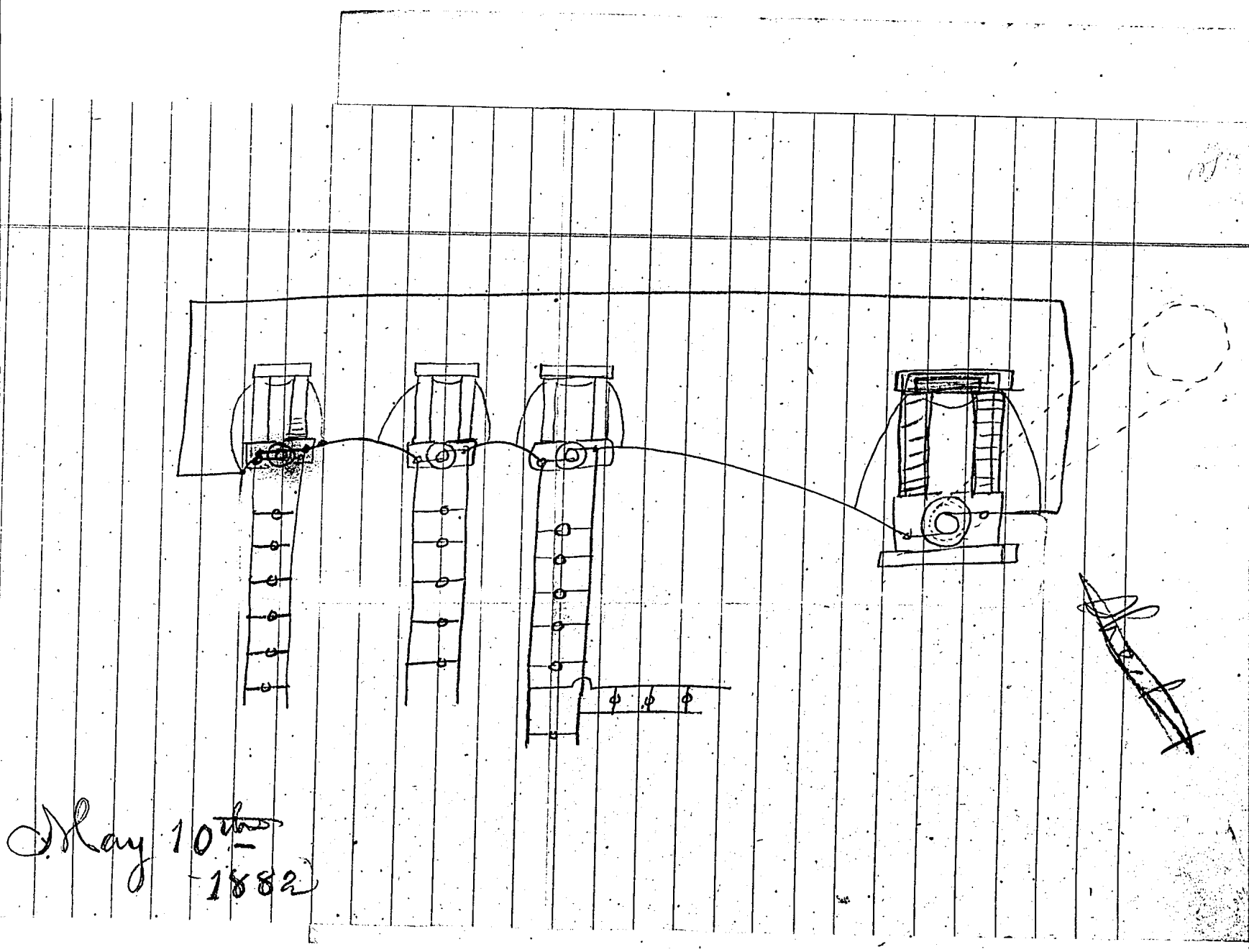
May 1882

T. A. EDISON.

May 8th.

Menlo Park, N. J., 1881.



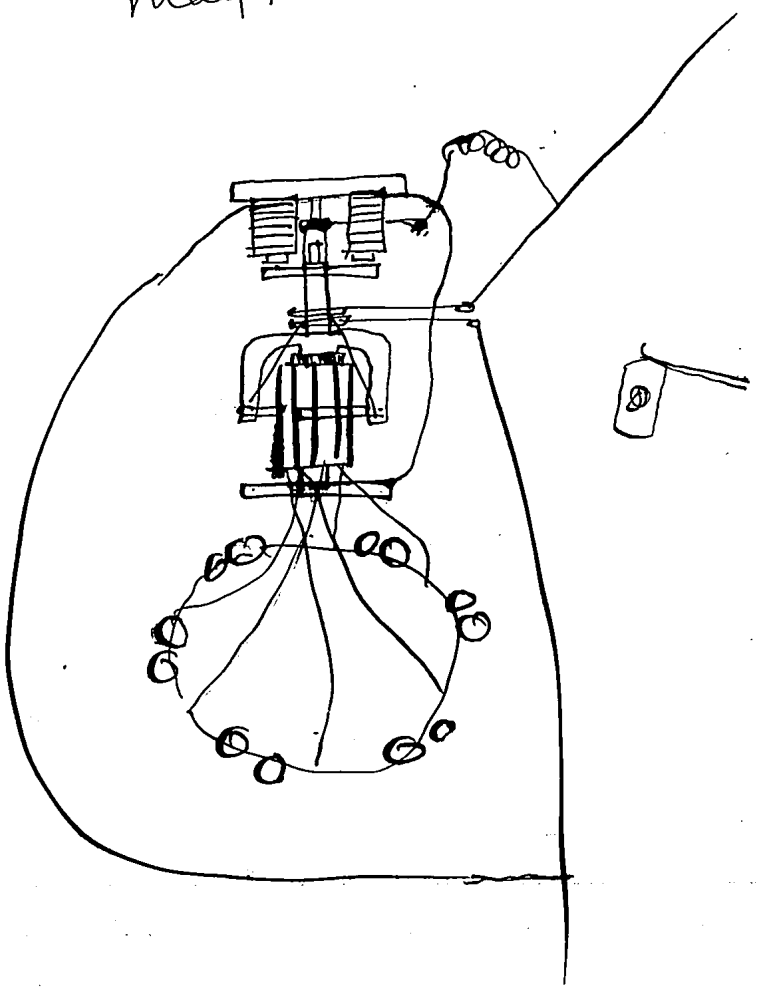


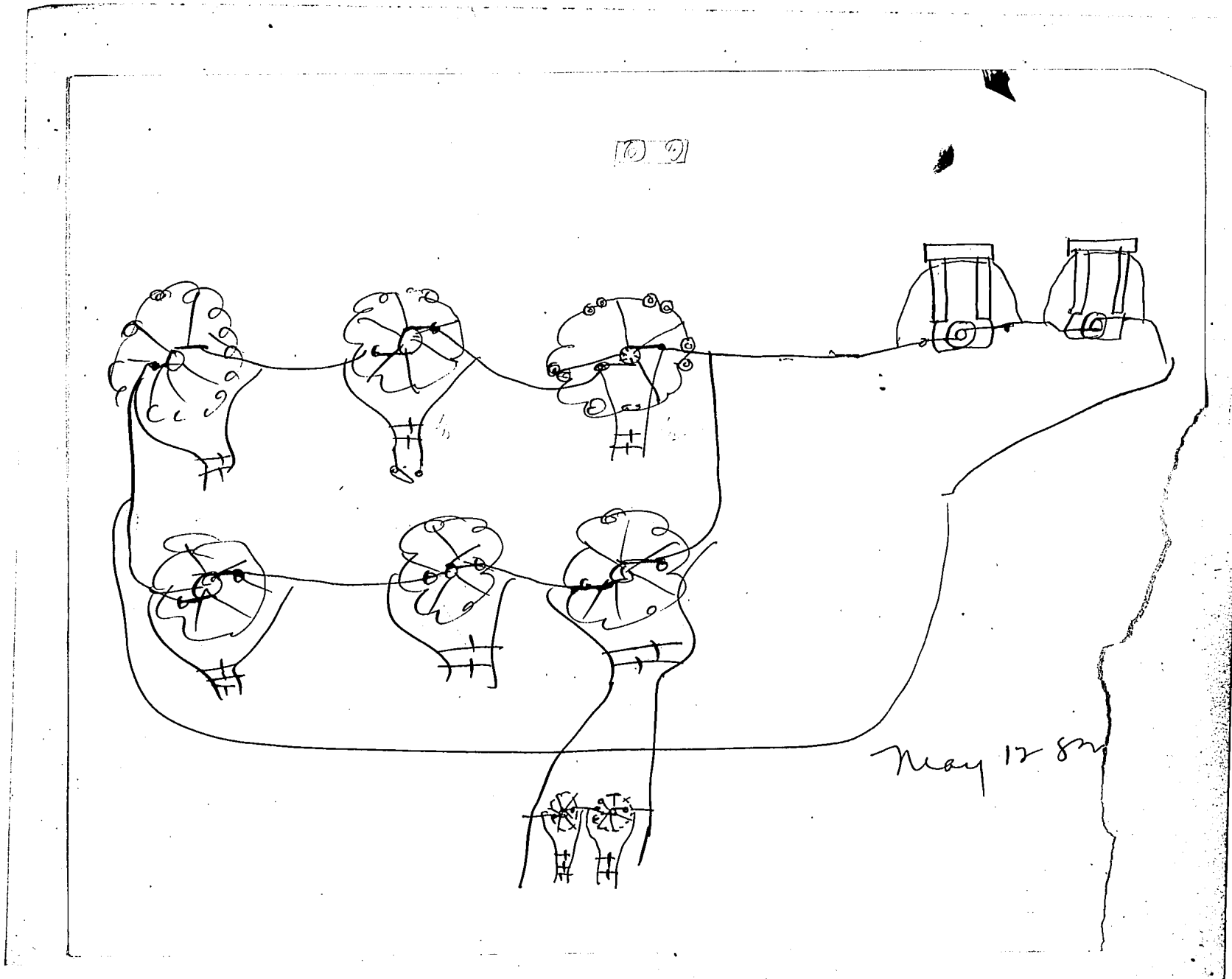
May 10th
1882

T. A. EDISON,

Menlo Park, N. J., ..... *1880.*

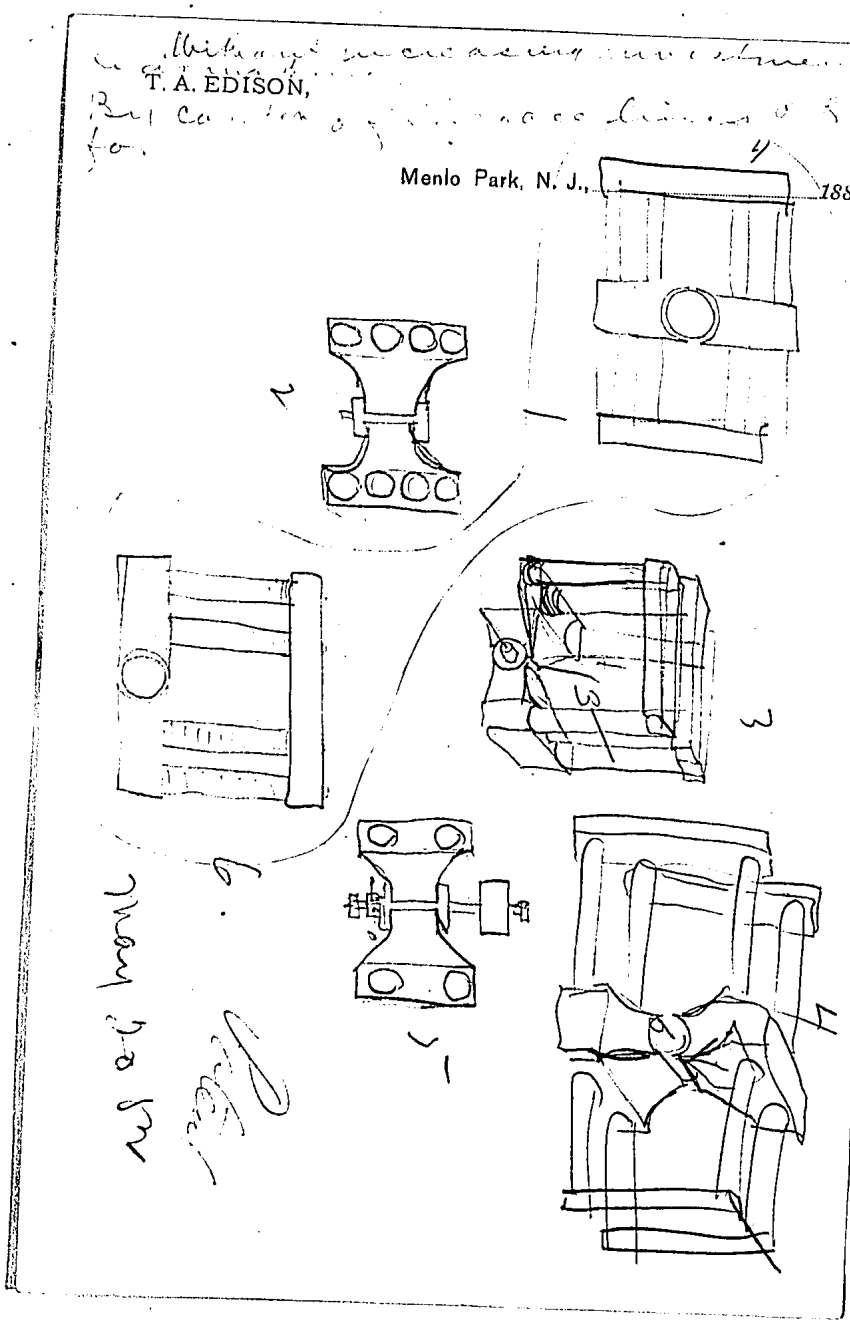
May 1 1880




May 12 82

T. A. EDISON,

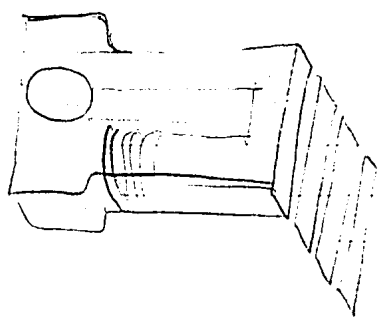
Menlo Park, N. J., 1881.



oncentration of fluid
in concentric cylinders.

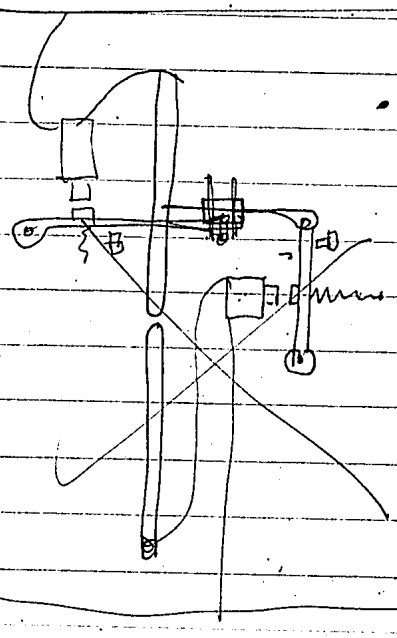
T. A. EDISON,

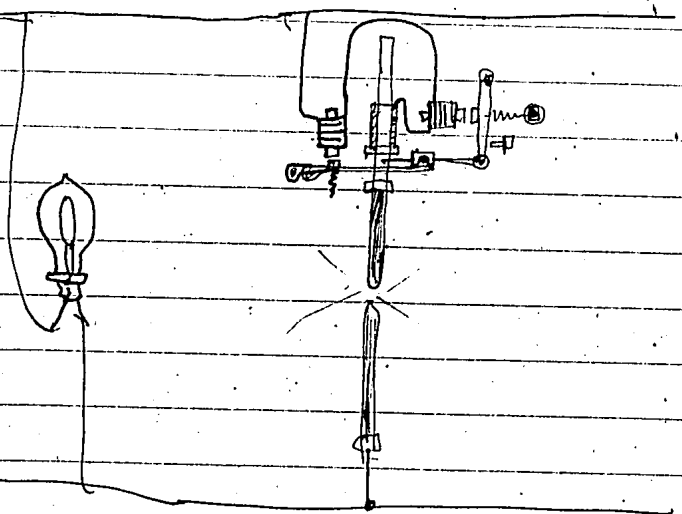
Menlo Park, N. J., .....

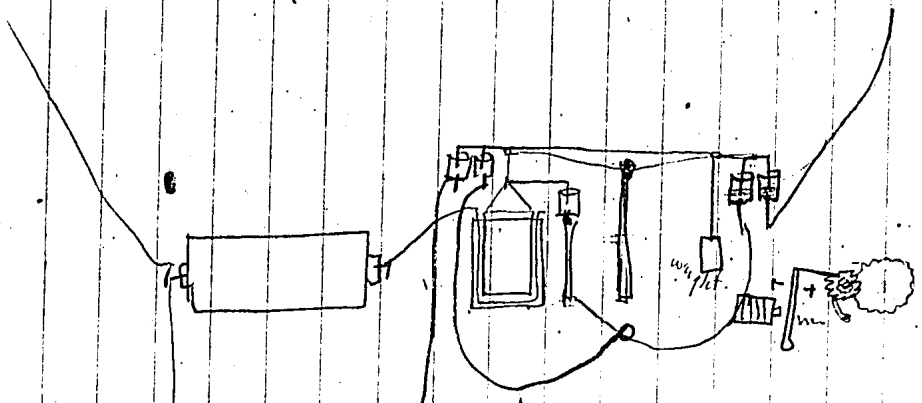


May 27 '82

Witness. R. N. Dyer.





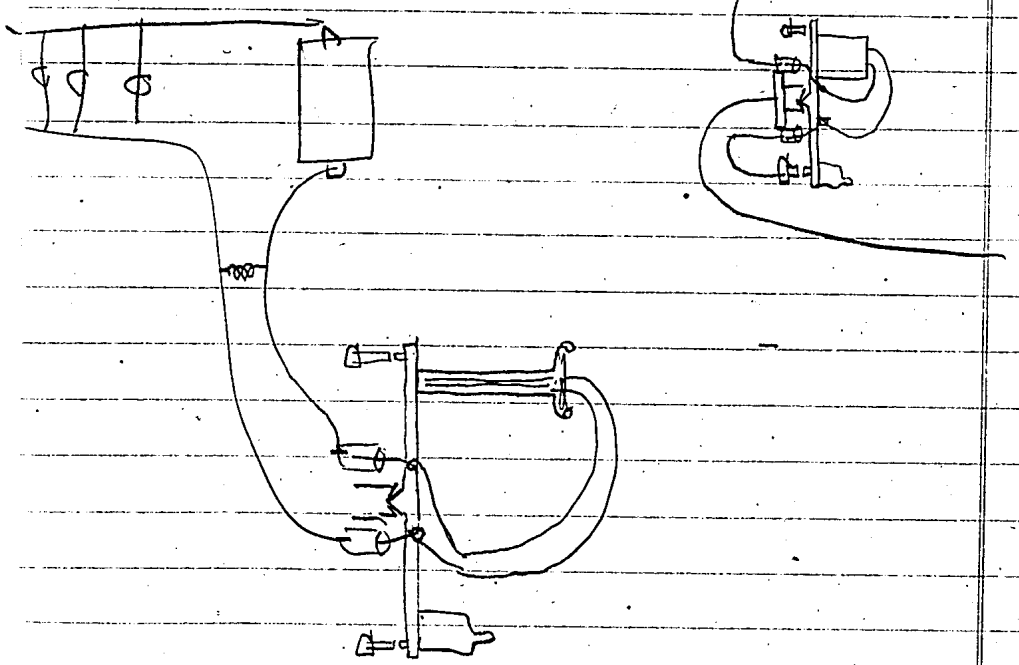


May 29
1852

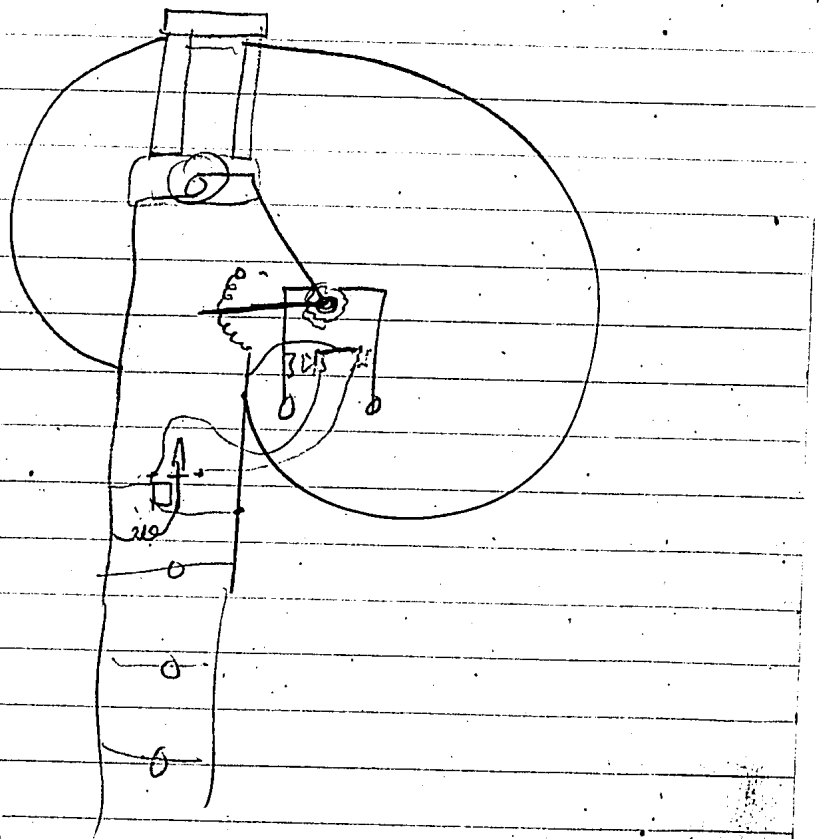
Taz

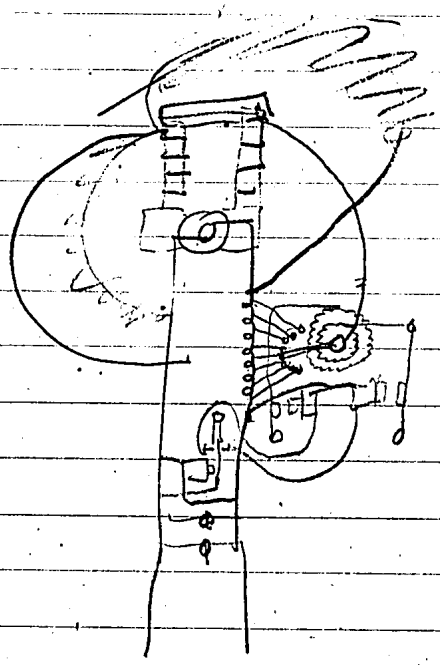
Can form shunt around
cell so that it will not
use much current.

May 29 80

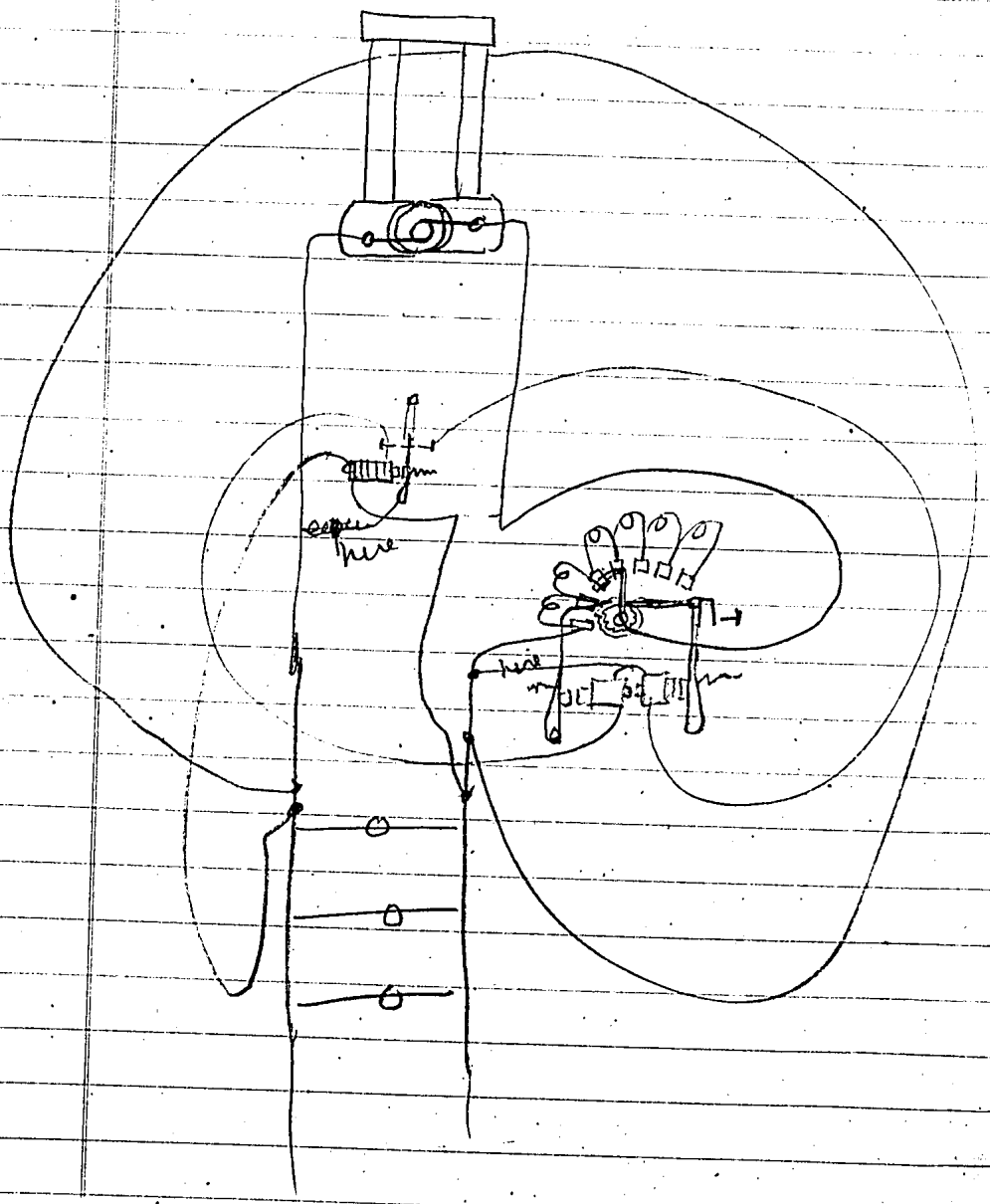


Okay Bro





May 81 1882 Tar



Claim flexible filaments of Carbon formed of Cellulose Carbon obtained from Cellulose or Compounds of Cellulose dissolved by proper Solvents & made into sheets or Membranes from which the ~~loop~~ Carbon filaments may be punched or cut before or after Carbonization or made into solid masses subjected to heat & pressure whereby it is forced through dies as a fine filament of pure Cellulose may be dissolved in ~~Cuprène ammoniac~~ Cuprammonia hydrate.

By means of heat and pressure the tissues from which may be formed into fine filaments such as can be twisted.

June 2 pm

flow calendon over glass.
allow dry ~~Cover~~ put membrane
Gritman sheets about over
mutual and punch out
Gritman punch Cantonese under
Gritman punch Cantonese under
also. Short Cellulid may cut
Dr. Mrs. Phelps & Cantonese

— June — 1882 —

Compounds of cellulose.

such as ~~Dis~~ tri nitro cellulose.
soluble in Ethylic acetate

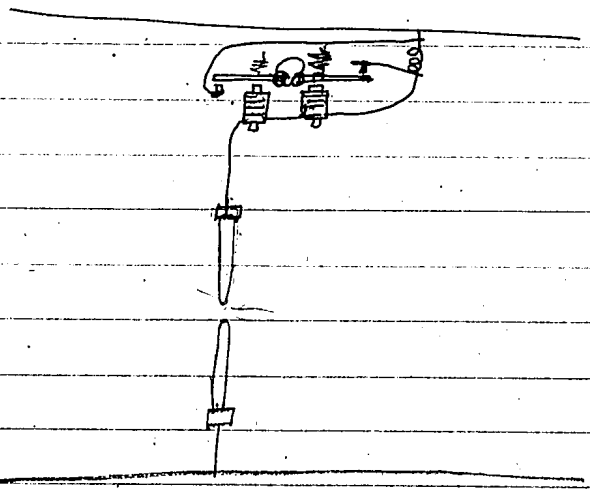
Other Nitrates of Cellulose
are Soluble in Alcohol & Ether,
Chloral & Camphor, acetone.
nitro Benzol,

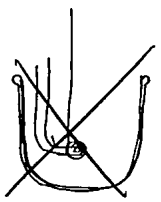
~~Other Carbohydrates~~

To journals 437 or drawing of 373.

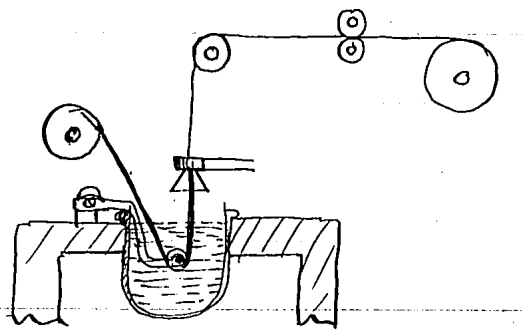
James V Fox

Safety device for a.c. lamps used in multiple arc





June 5th 1882



June 3. '82

~~A~~ asphaltum
dissolved in turpentine

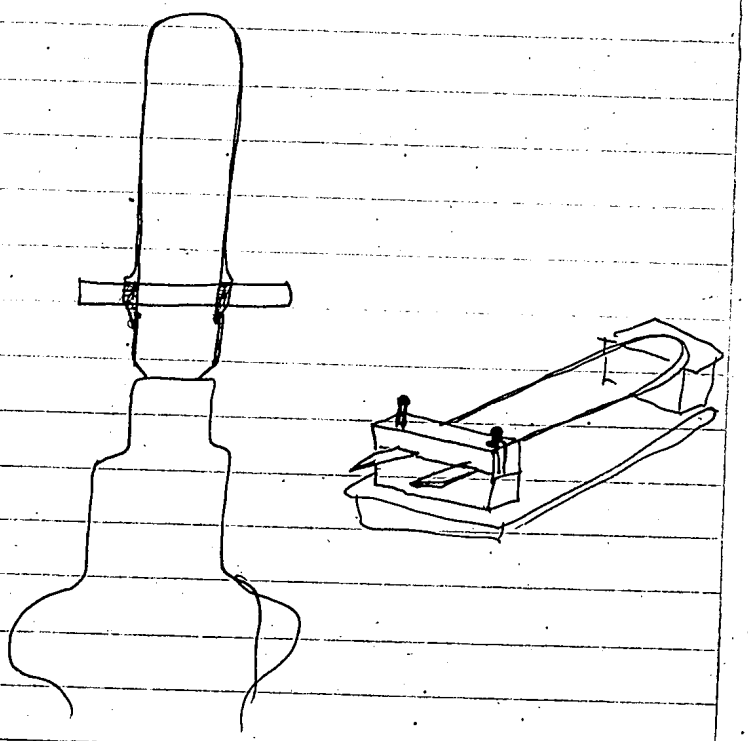
~~A~~ asphaltum mixed in
proper proportion ~~to~~
with a drying oil
such as Linseed to form
a japan —

Coat ~~a~~ polished metallic
plates with layer of very
thin liquid ~~[illegible]~~
and bake in an oven for
several hours until the
coating is very hard,
The plate is then put in Nitric
or other acid & ~~[illegible]~~ dissolves
leaving ~~the~~ a very flexible
dense film from which fulminate
of Carbon may be obtained
by grinding

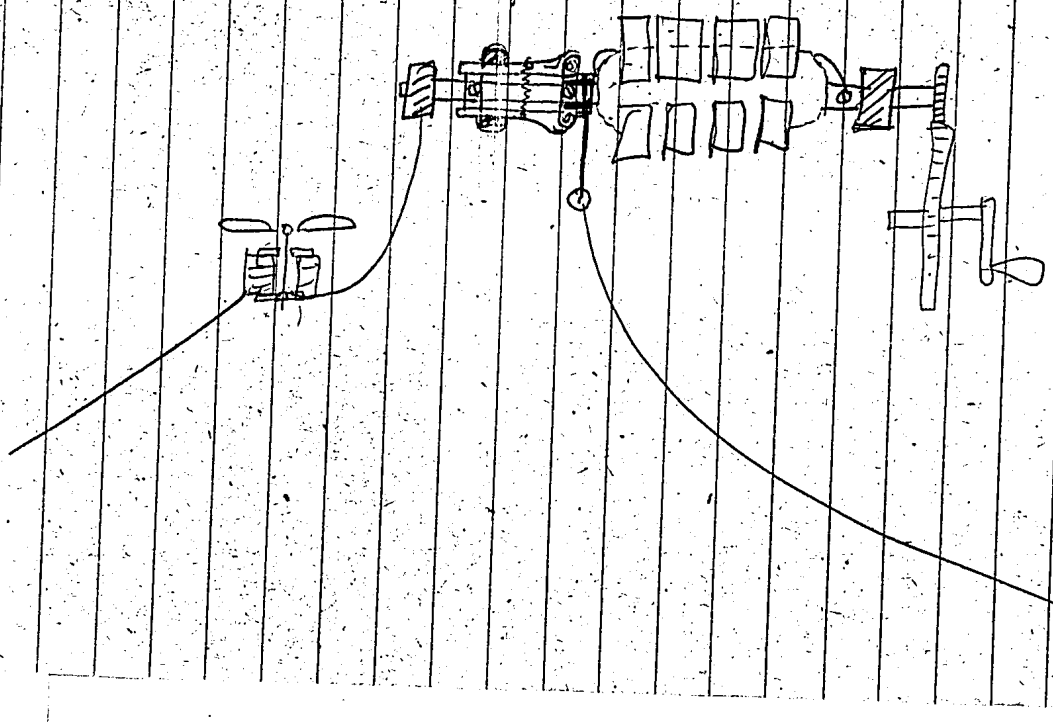
~~If all high~~ The surface may
be covered down or made to a
number of ~~[illegible]~~ Lines may be put
Lines or such plates dissolved by hydrofluoric acid

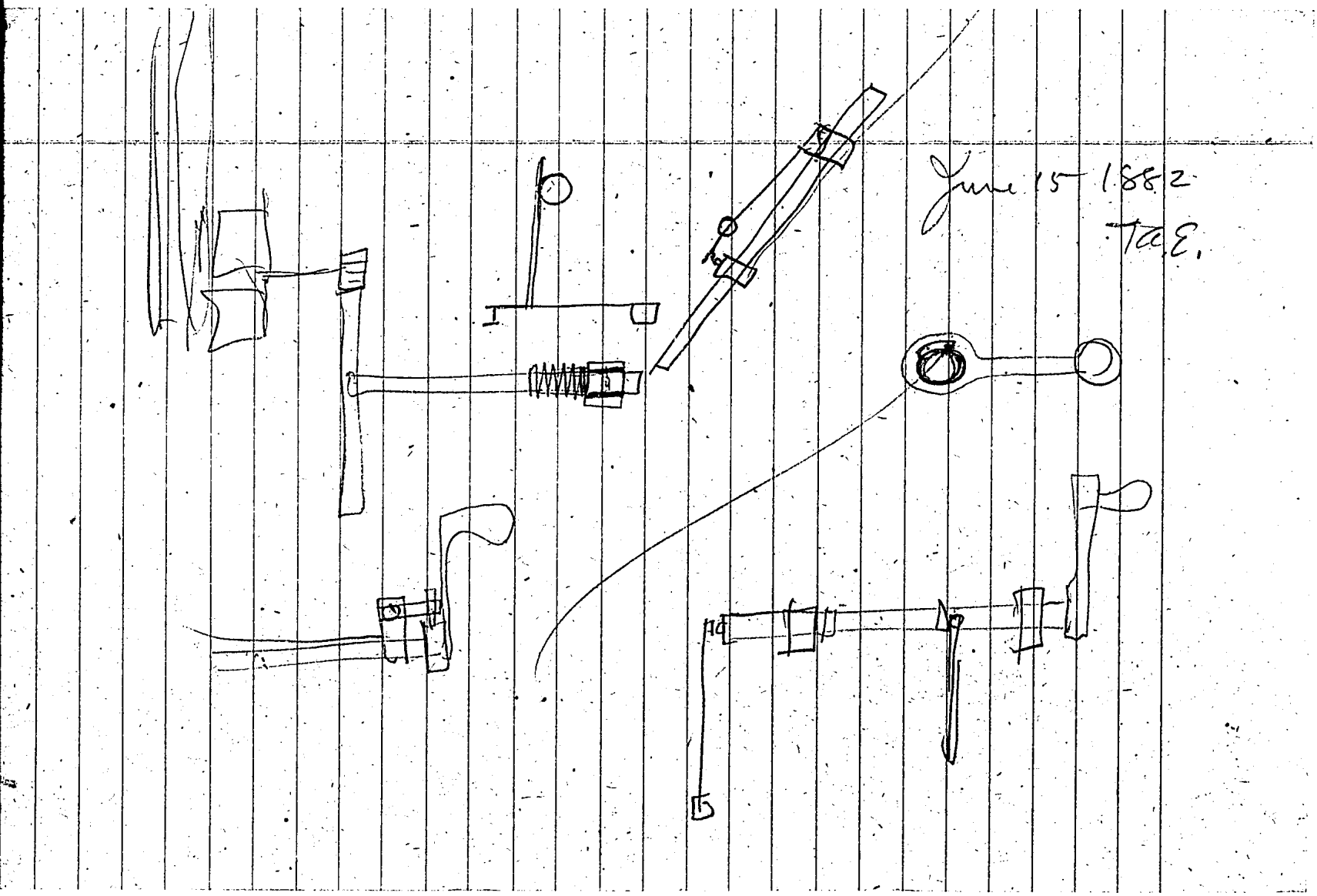
Keeler machine for making [illegible]

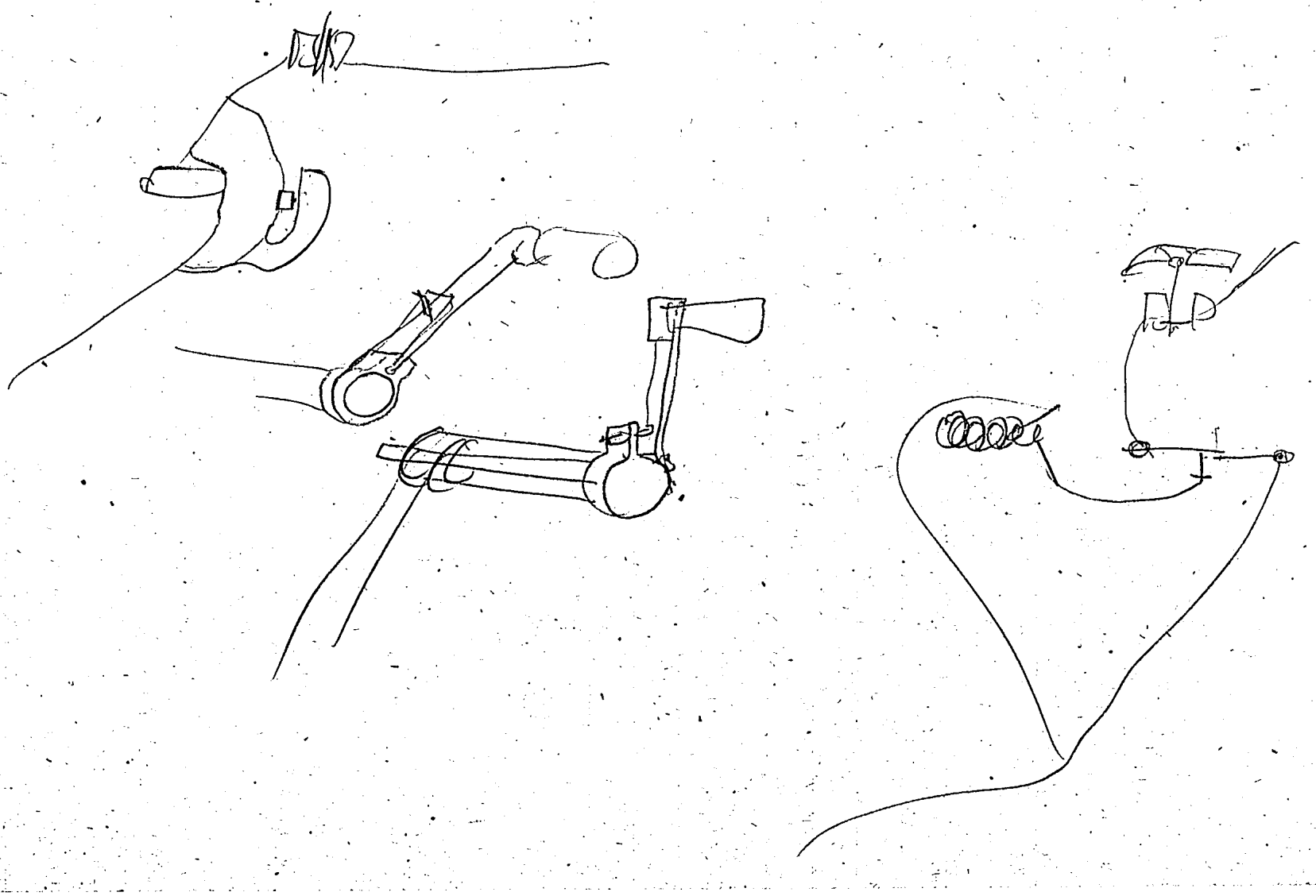
films or membranes of Oxidized
mixed with rubber
linseed oil ~~mixed~~ with or ~~without~~
~~without asphalt, or asphalt~~
~~alone~~



June 1-8th/52




June 15 1882
T.A.E.

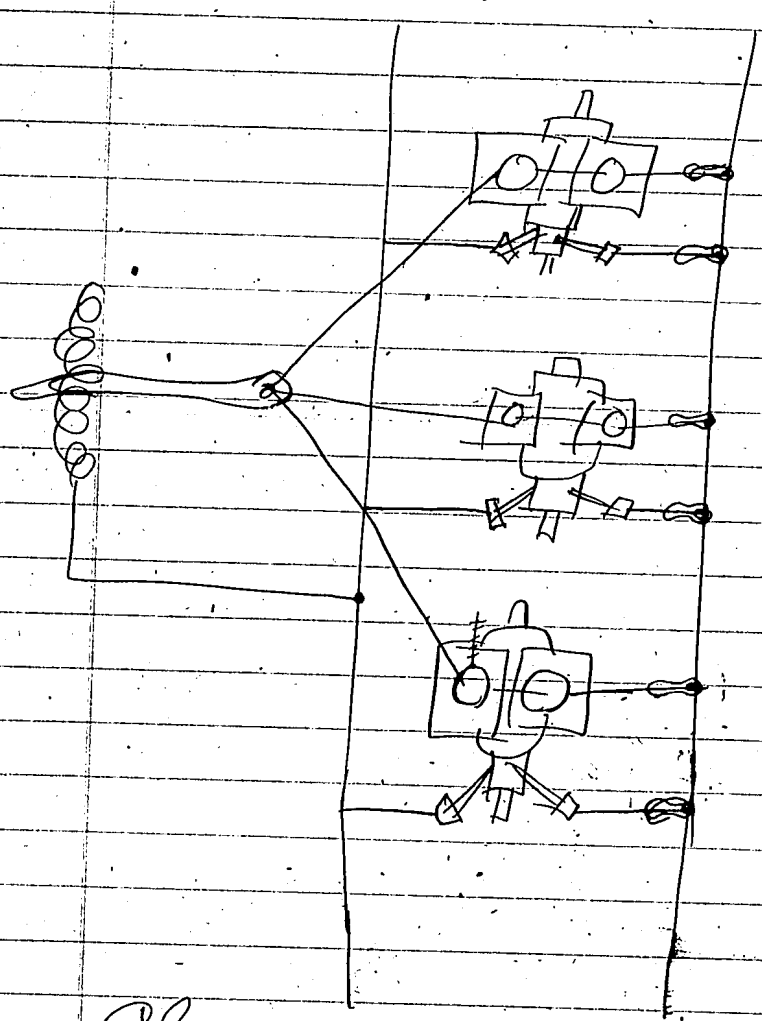


Central station case.

(Put in next is alternate regulation case, two or more machines with common automatic regulator + Claim Range. Same as Case of Control.)

Make Patent for

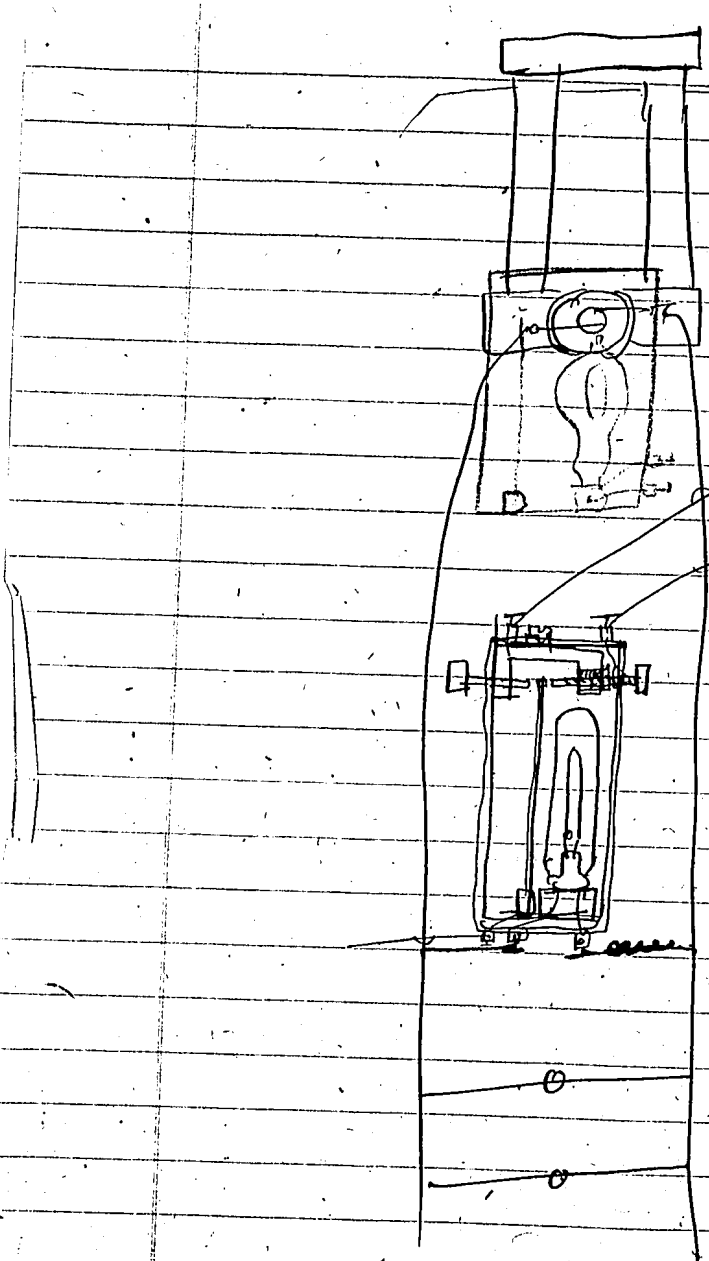
method of disconnecting dynamos or magneto electric machines arranged in multiple arc, consisting in first breaking the circuit of the machine



June 19, 87.

Witness
R.H. Dyer

Claim same reservations for two or more multiple arc fields.



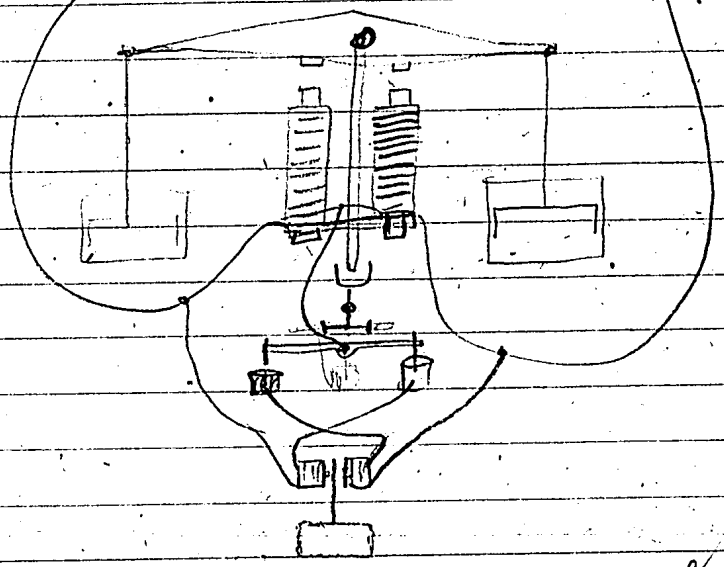
June 19 8--

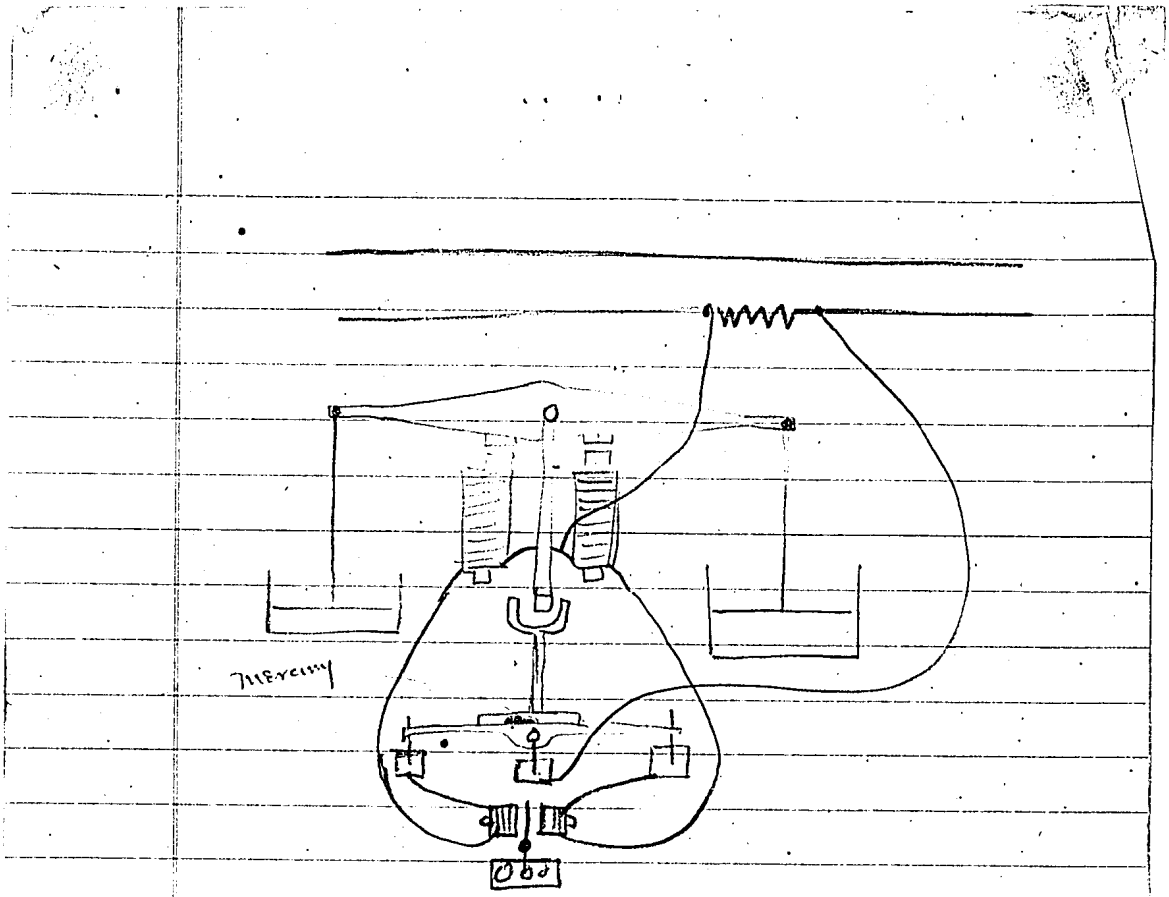
Heat may be used to work all
kinds of expansion apparatus
such as a working on a diaphragm
or direct expansion of
Mention reflector to throw heat
on spring. Spring may be called
expansion
Lamp weight to
Mercury tube. Float D. close circuits

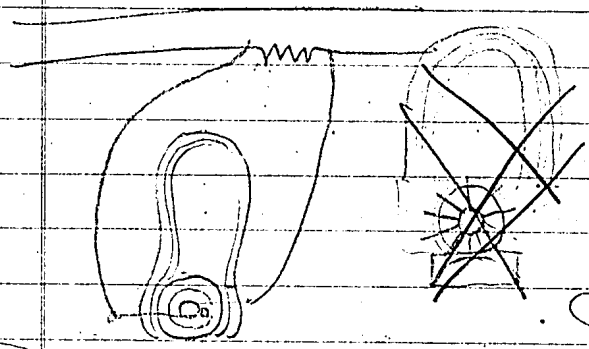
Placing in Camp permanently a company for a [illegible]. a means vapor [illegible] phosphorus and [illegible], Chloride of calcium, & any other drying agent - proof - [illegible].

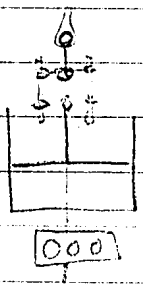
Placed in Camp, or in tube, or in tube left in Camp long time & then sealed off! Proof. Kept in permanently.

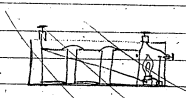
June 19 82

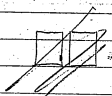


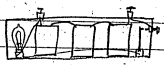


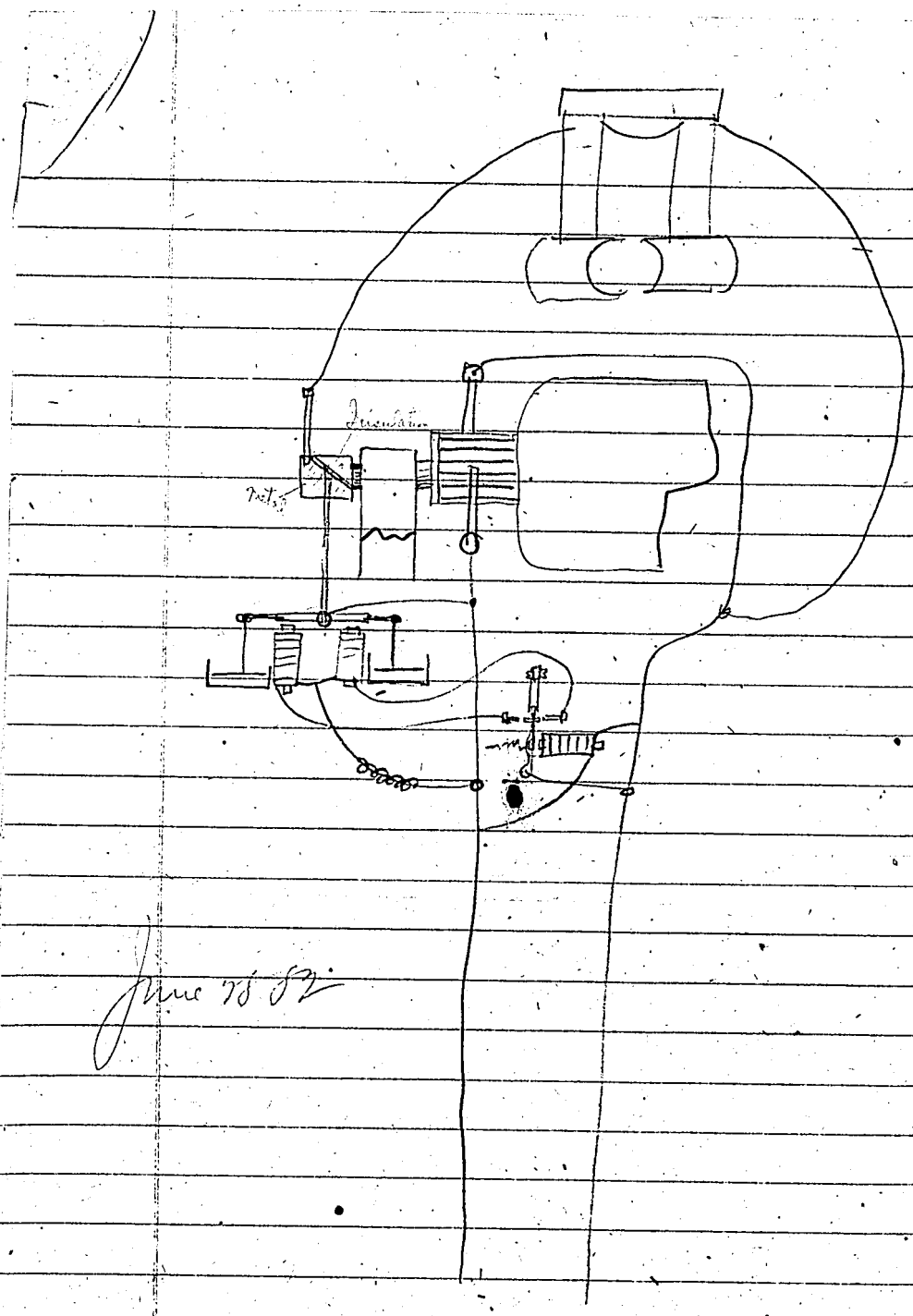












June 28 82

Minimum amount of water

dough

[illegible] and kneaded

[illegible]

molecules [illegible] are pushed

[illegible] which are [illegible]

[illegible]

Also the dough is forced

[illegible] fill a chamber

through an orifice in the shape

[illegible]

[illegible] is [illegible] a taxtia

pieces put on the Ends.

The dried under steam

& steam & pressure & then

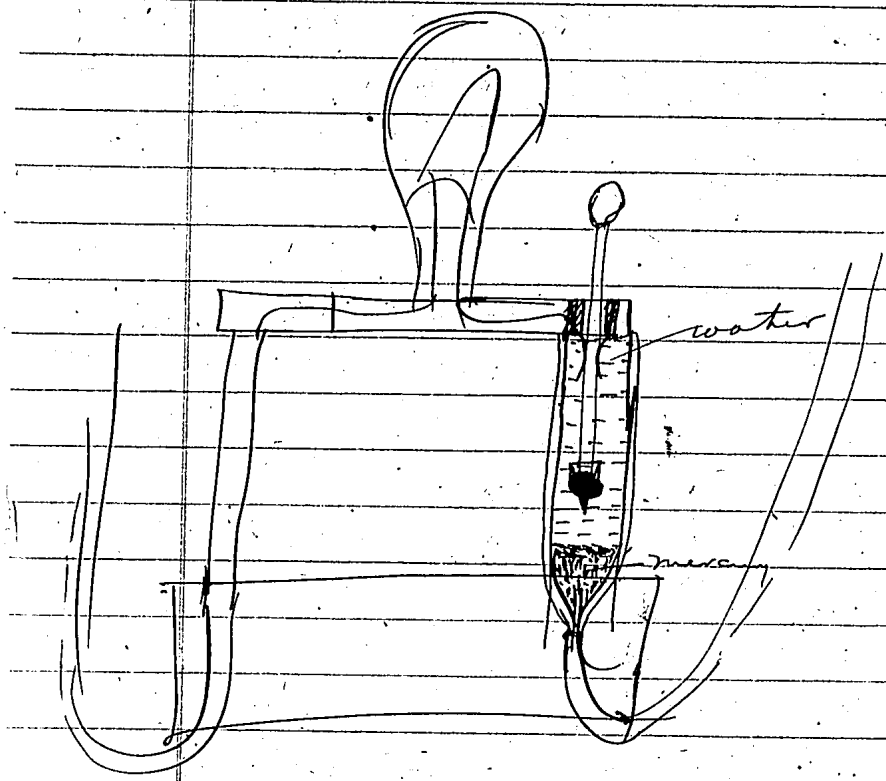
[illegible] in any desired

shape then Carbonized

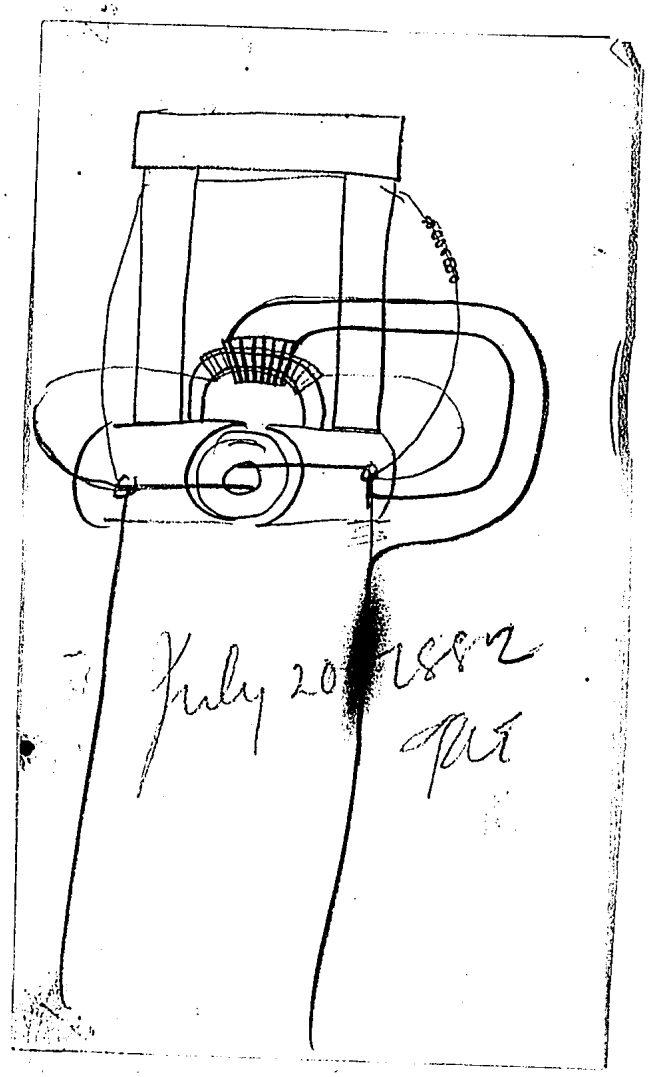
[illegible] steam & pressure.

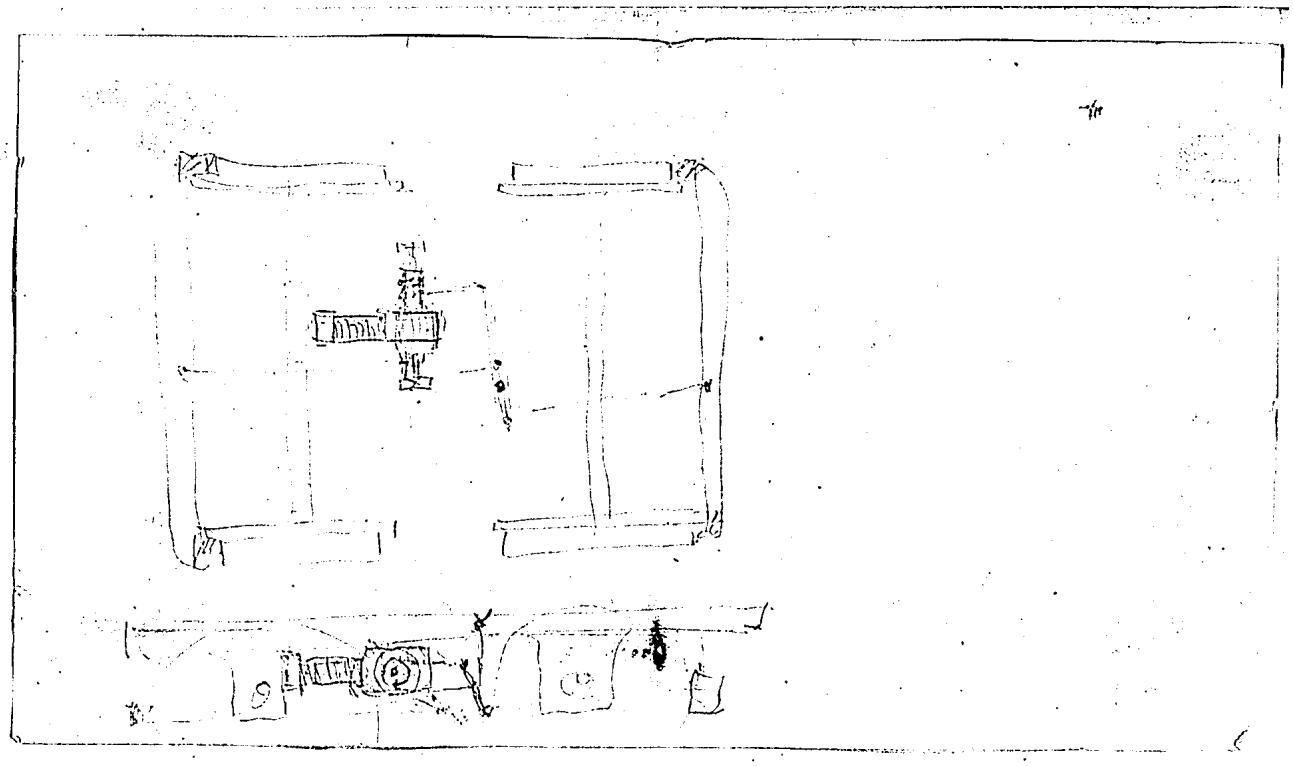
June 2nd 87

More or less of all of the flour may be found in the gluten used. Examine gluten broadly




Mixing Launch
with one movable connection.
July 7 '88
R. A. Dyer


July 20 1848



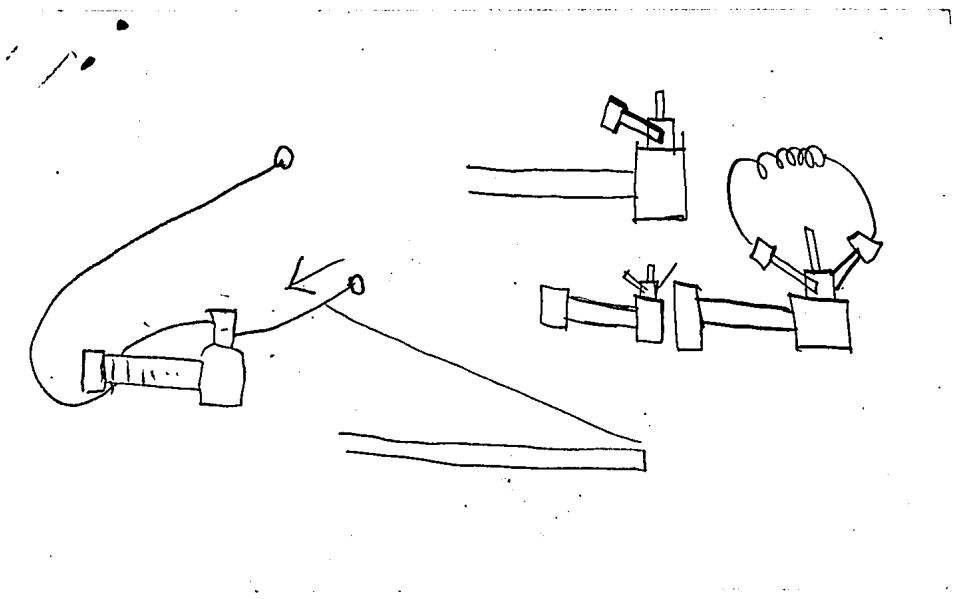
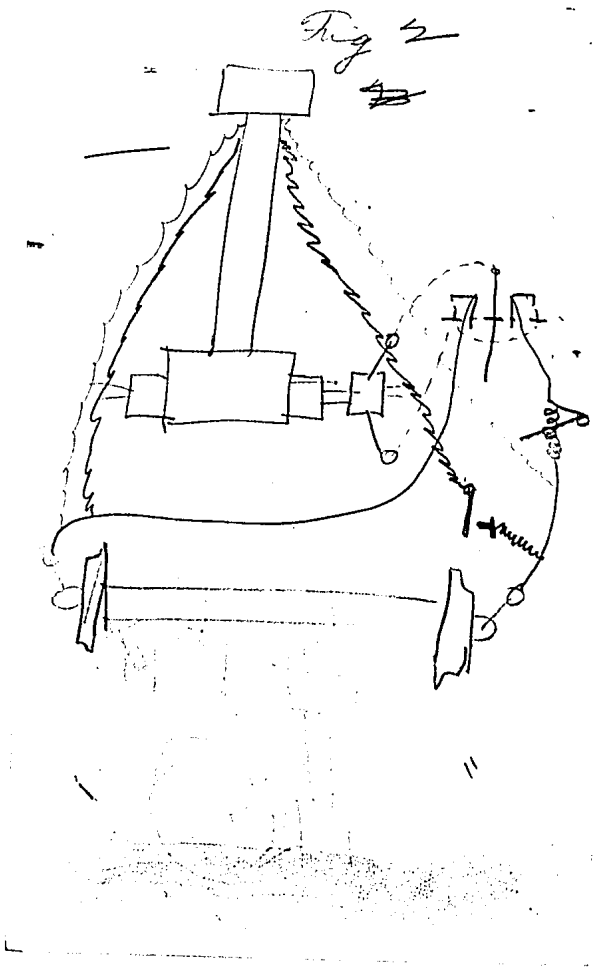
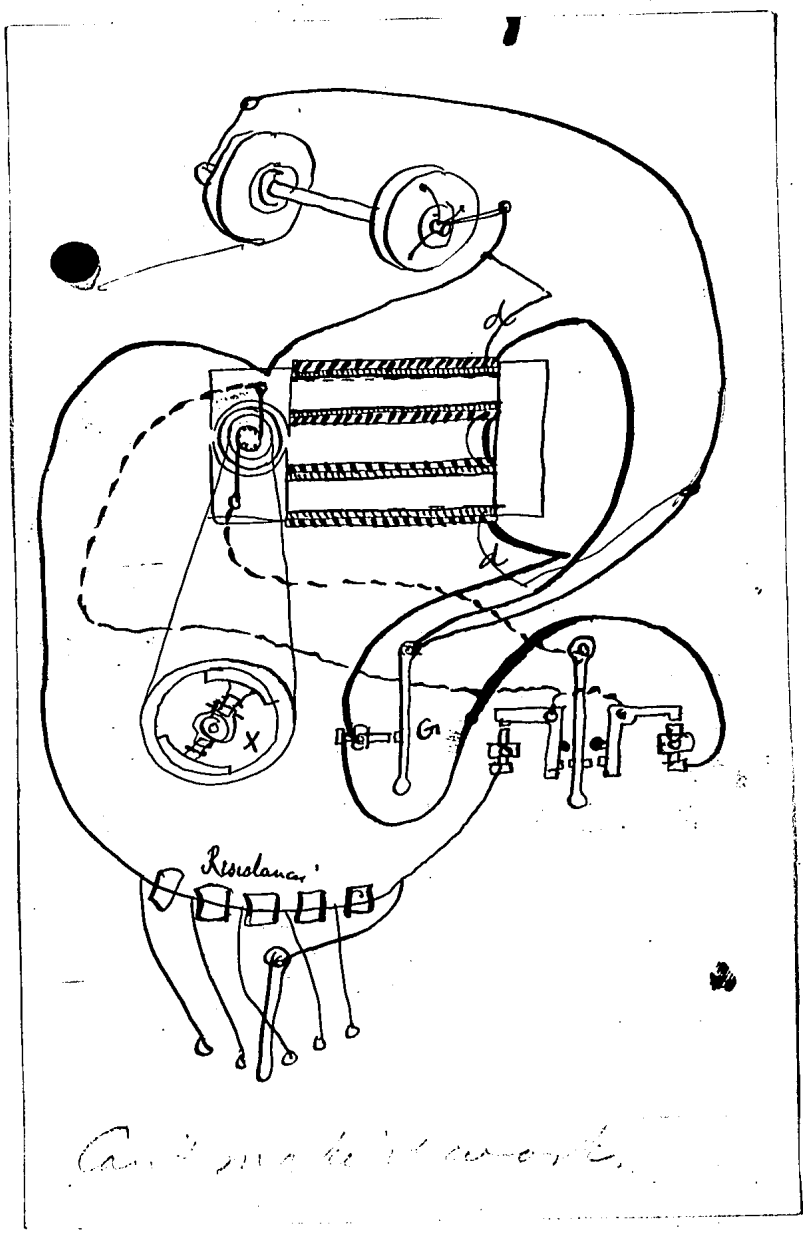
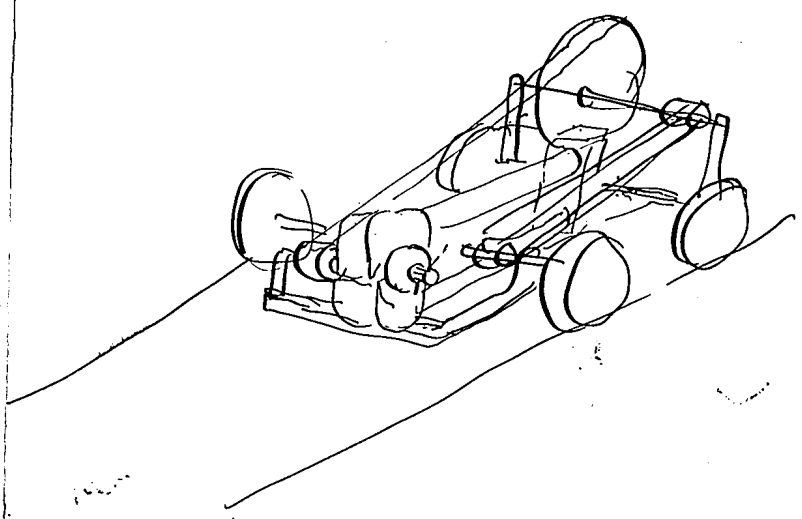


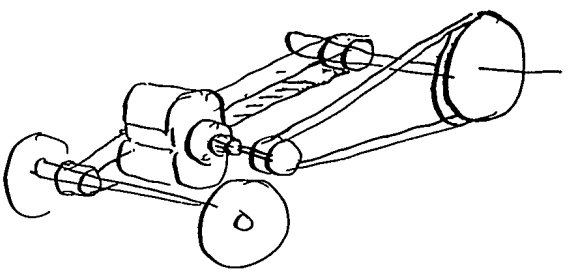
Fig 2




X
G
Resolance



Matt make a drawing from the photograph
of the Locomotive for a patent
Lowell has a photograph - shew belts clearly



THOMAS A. EDISON,
MENLO PARK, N. J.

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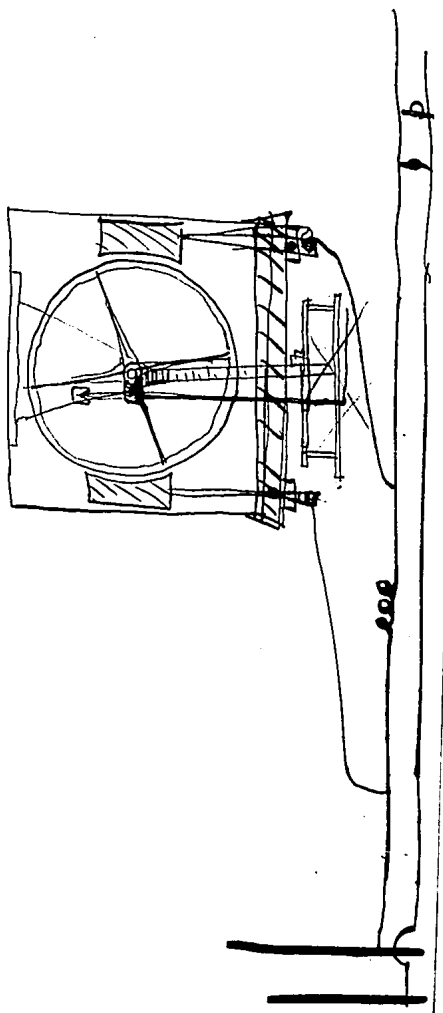
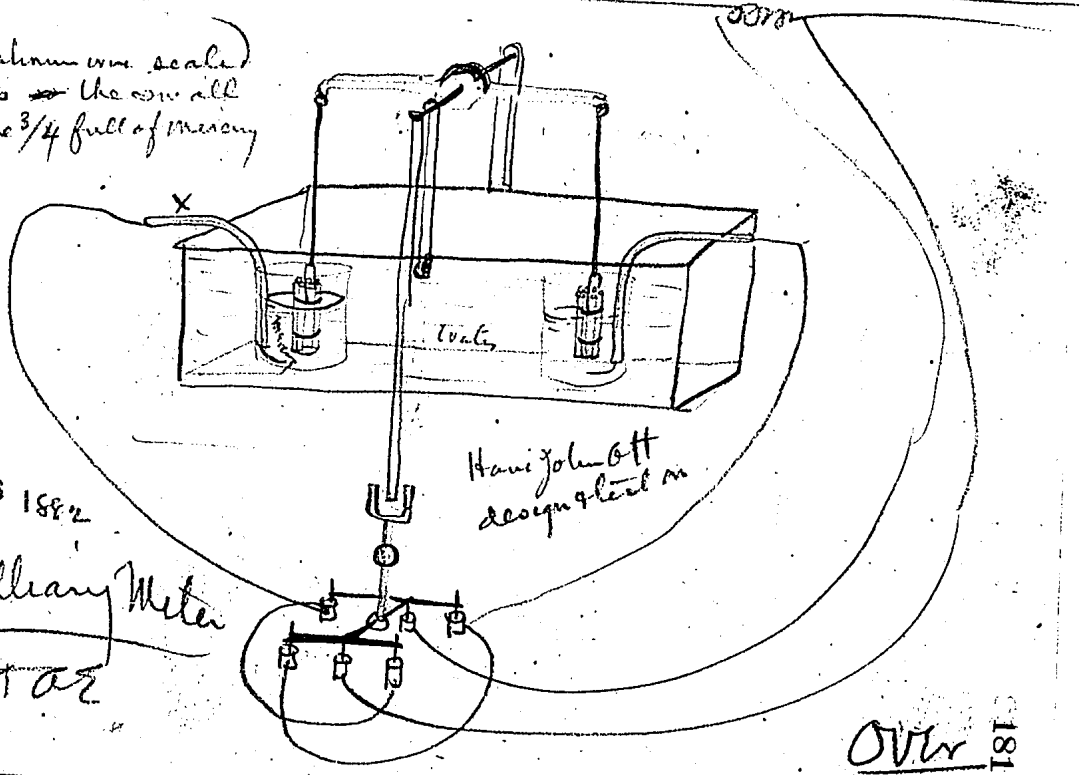
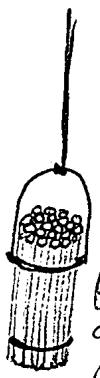


Aug 2. 1882

August 1882


X is platinum wire sealed in glass & the small joints are 3/4 full of mercury
X
Aug 13 1882
Capillary Meter
Hari John Gott designated as
OVer
181



bundle of glass tubes

fig 2

Large square trough filled with water

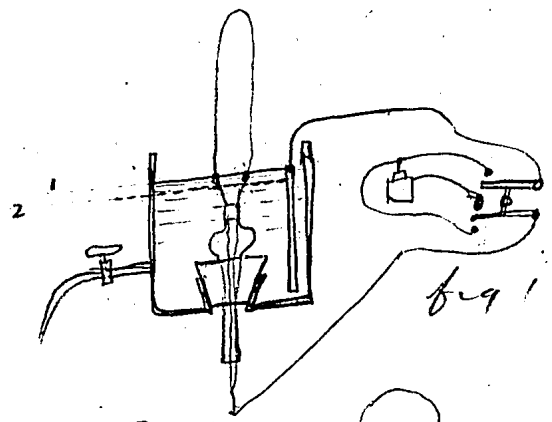



fig 1

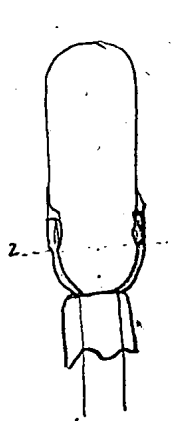
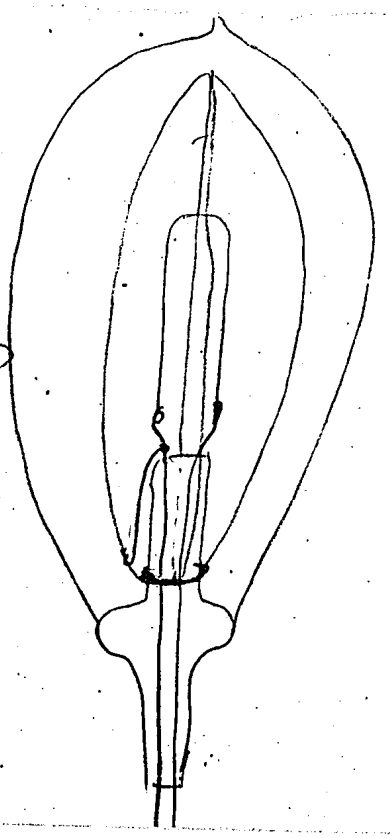



fig 2

fig 3

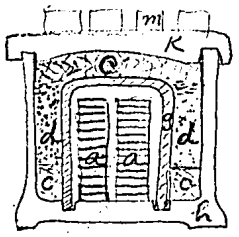


Aug 18.
1882

207

object to exclude ~~oxygen~~ air
& Carbonize under a pressure.
Carbonized Cotton insoluble to
oxidation absorbs Oxygen

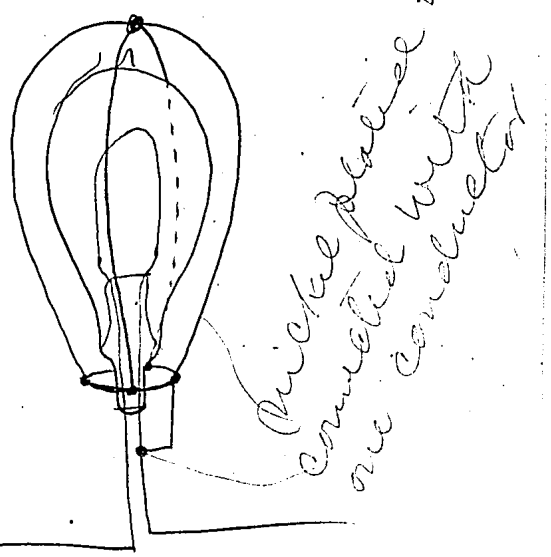
Plumbago Covers are the regular
Plumbago Crucibles made with clay




Aug 18th
1882

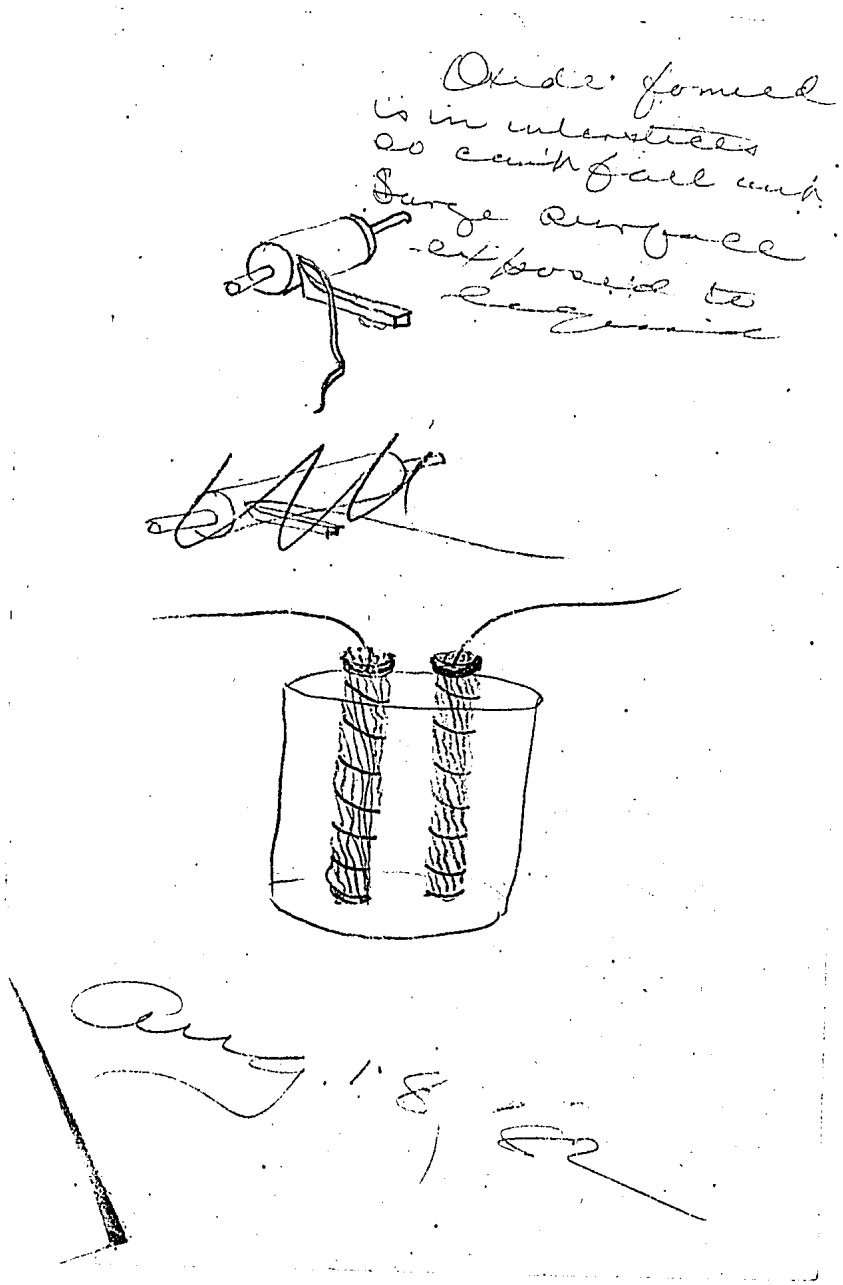
Mould for Carbonizing

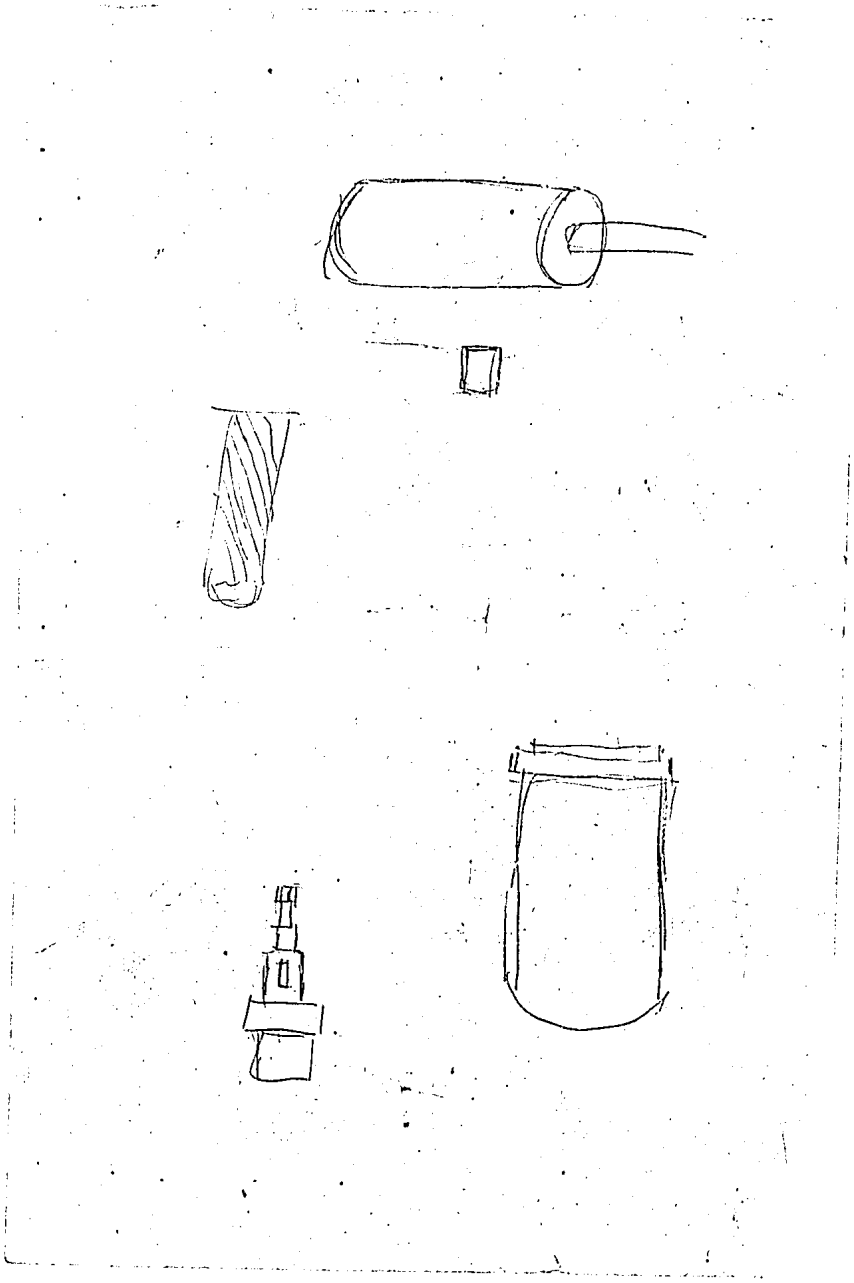
a a Carbon forms holding the fibres.
c c c Carbonized Cotton,
d d. plumbago tamped
g inside plumbago Cover.
h outside plumbago
Cover K Plumbago top.
m fire Brick to weight Covers down

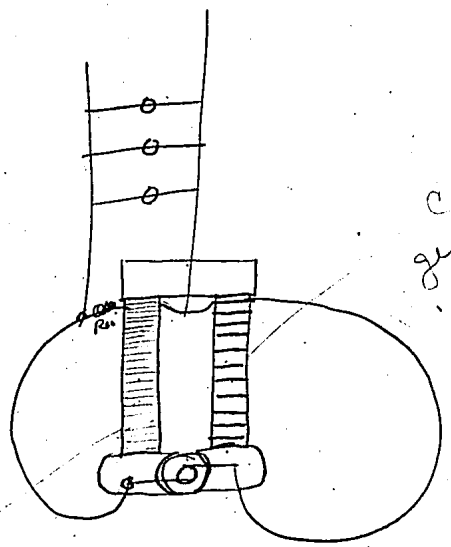



Nebulous state of
attraction of particles

Aug 18th 1852

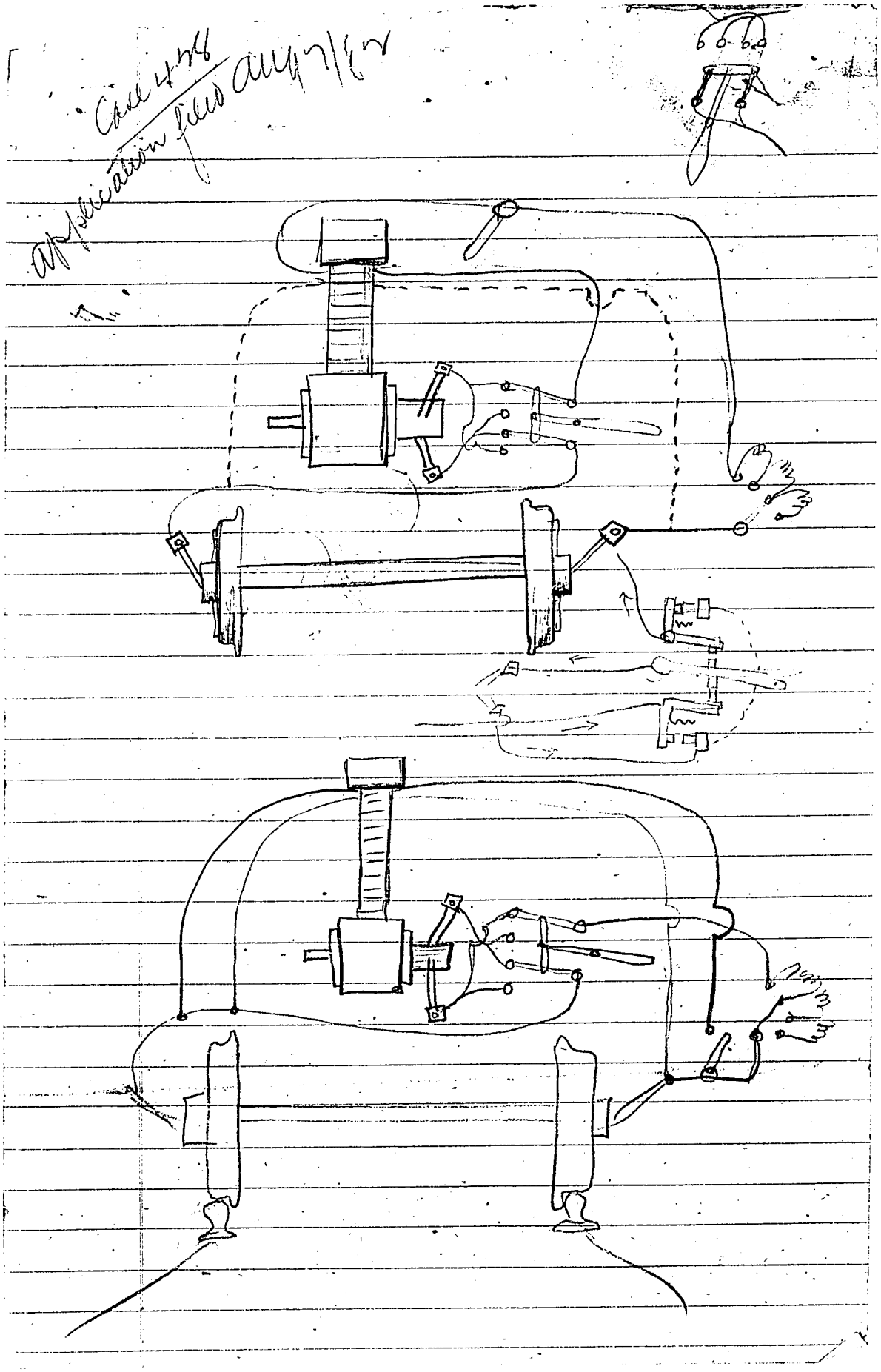

Oxide formed
is in interstices
so can't fall out
Surge current
- withstood to
Engine



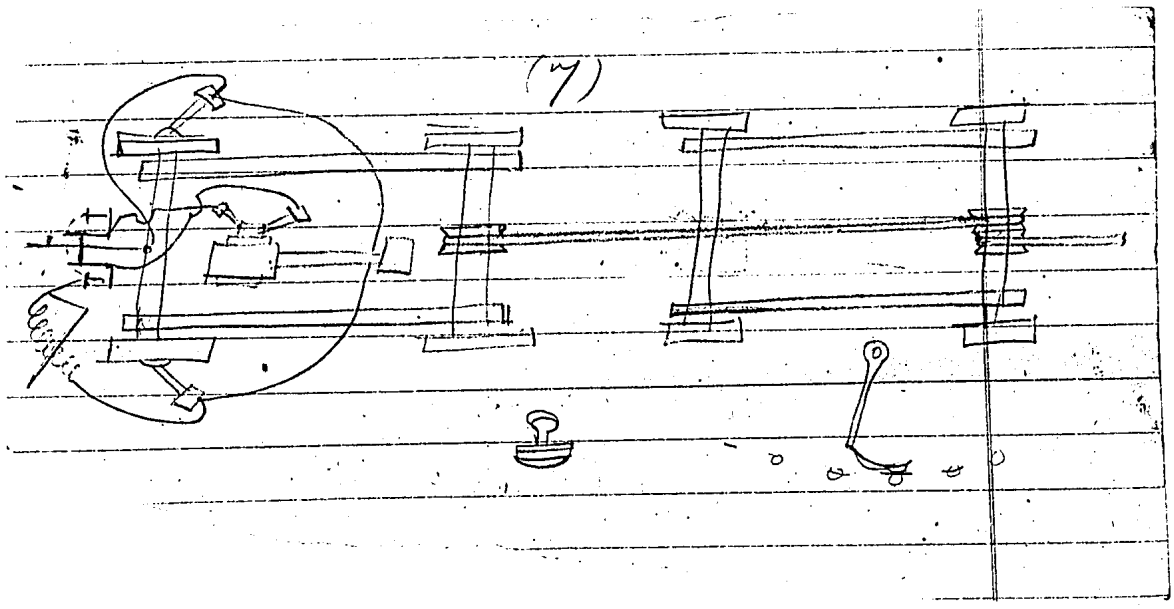


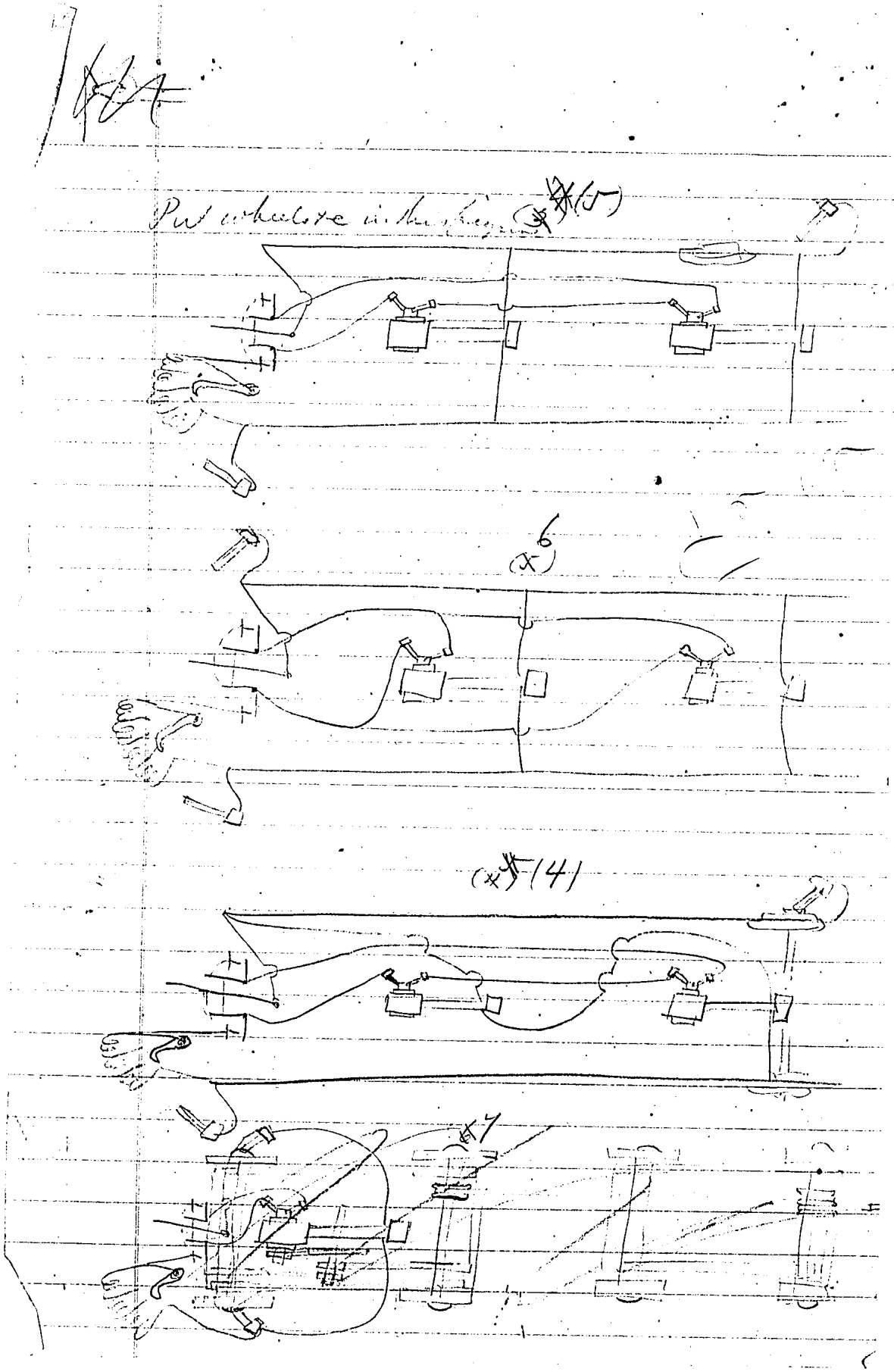
Aug 19, 82

Case 4776
Application filed Aug 7, 1917

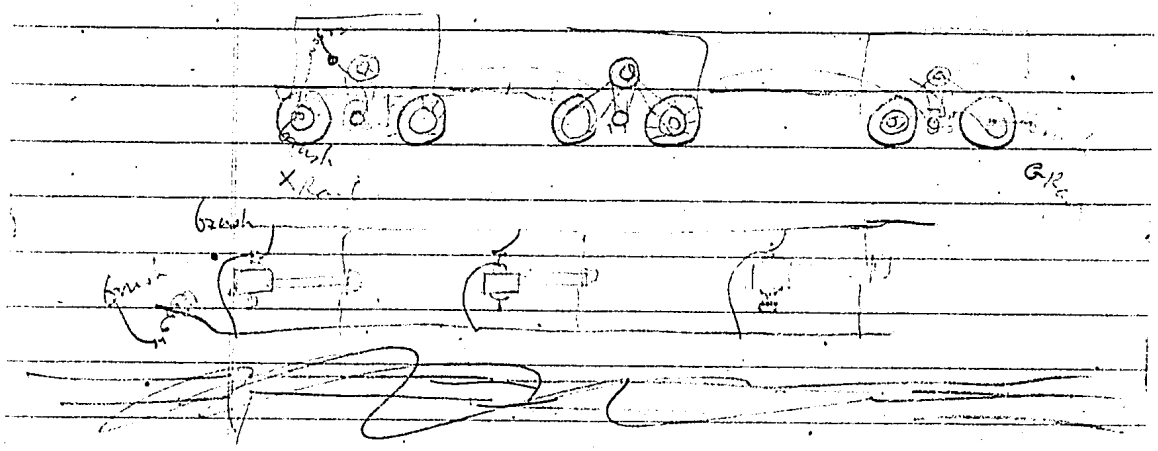


(7)

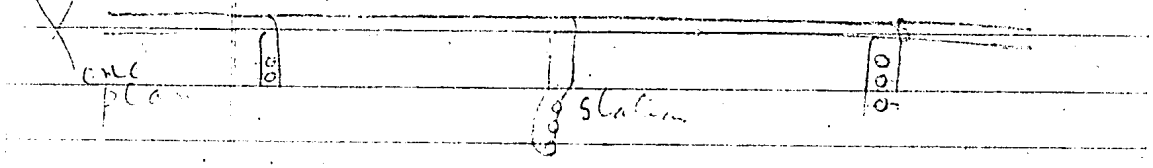


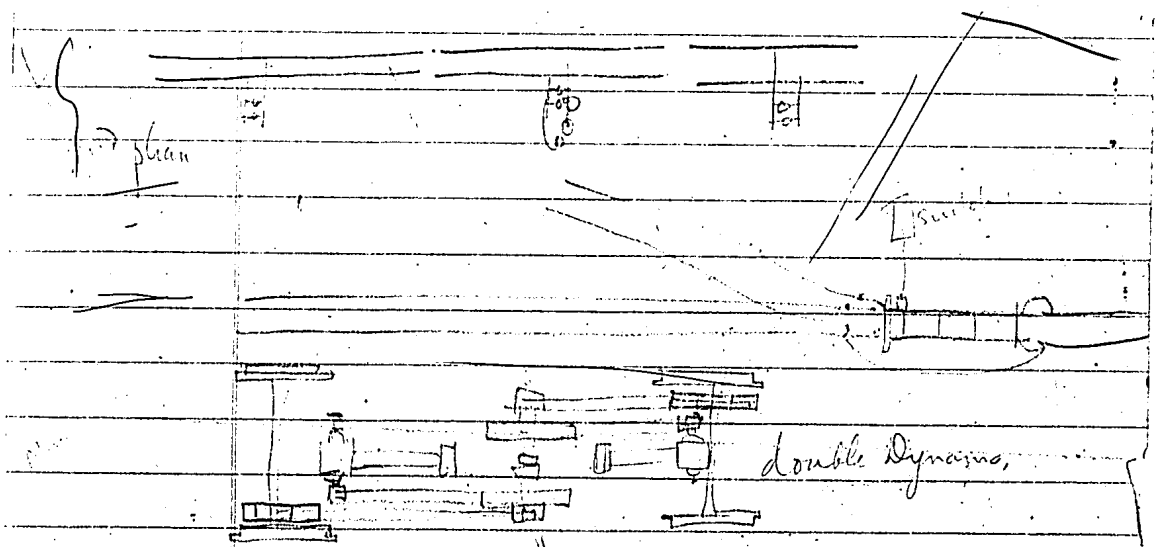


Dynamos in Series



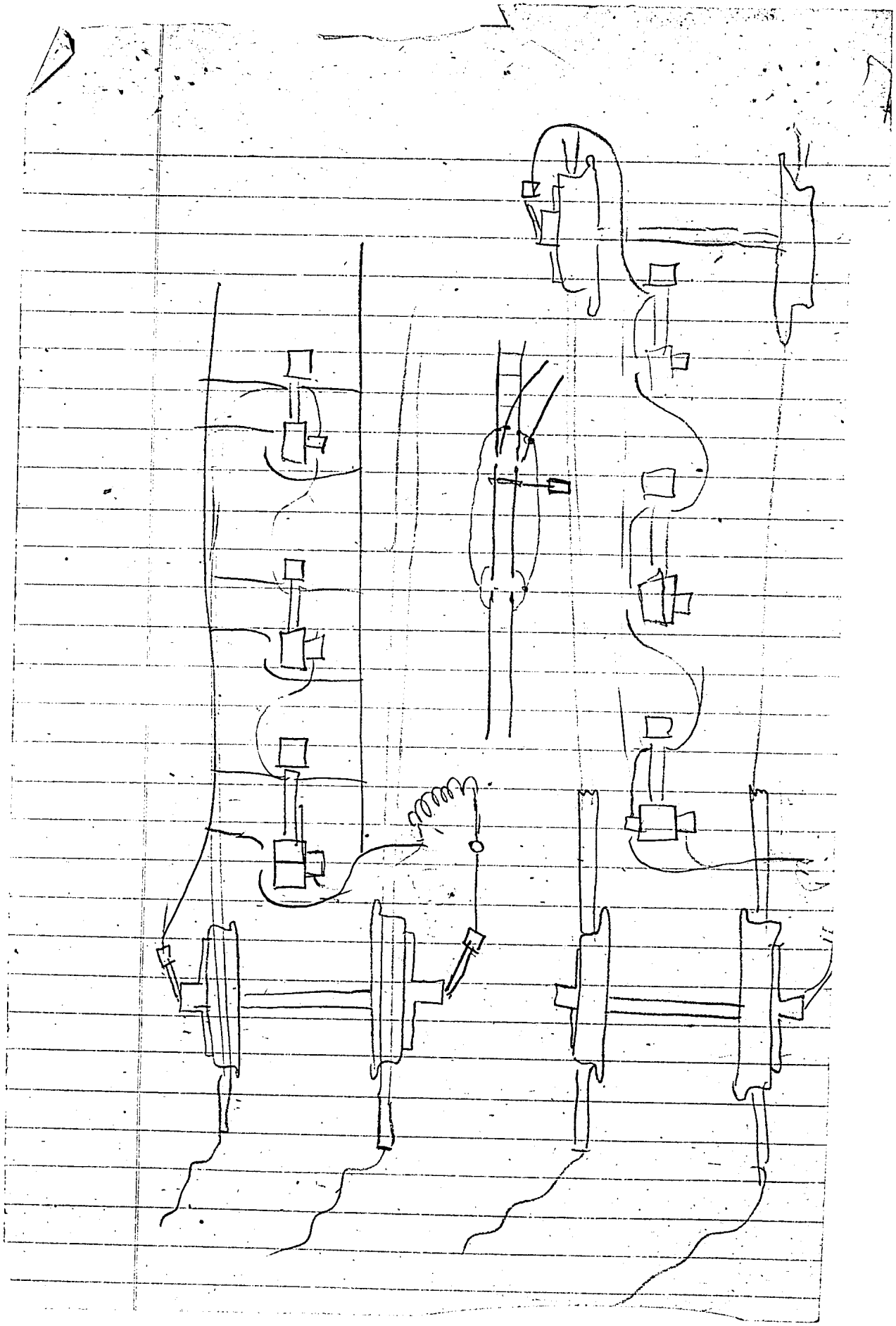

dip the rail except top in a japan
& bake on -



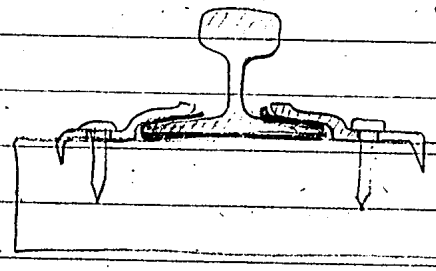




Tires dipped in boiling mixture
(Compound of Linseed Asphalt
or not)

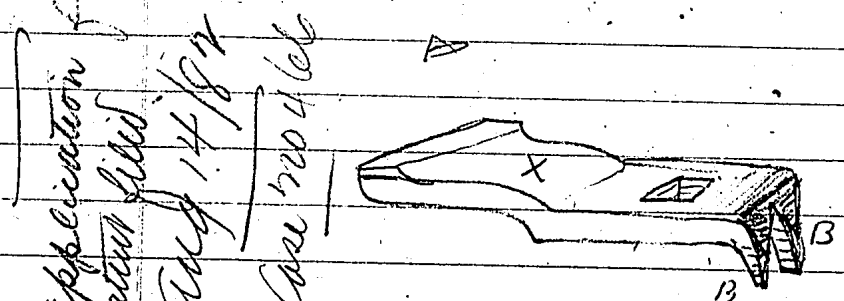
Nickelplate the Ends of the rails
ditto the fish plates, middle a nickel plate
Copper strips heavy or not to use



Whole rail except tipped japanned by baking process. X japanned. Cloth under rail & over clamping pad X worn it this is also japanned & baked



Brakes are japanned. The clutch of may be taken out of the gearing & the driving rail [illegible] baked to thick cement [illegible] & also & baked.

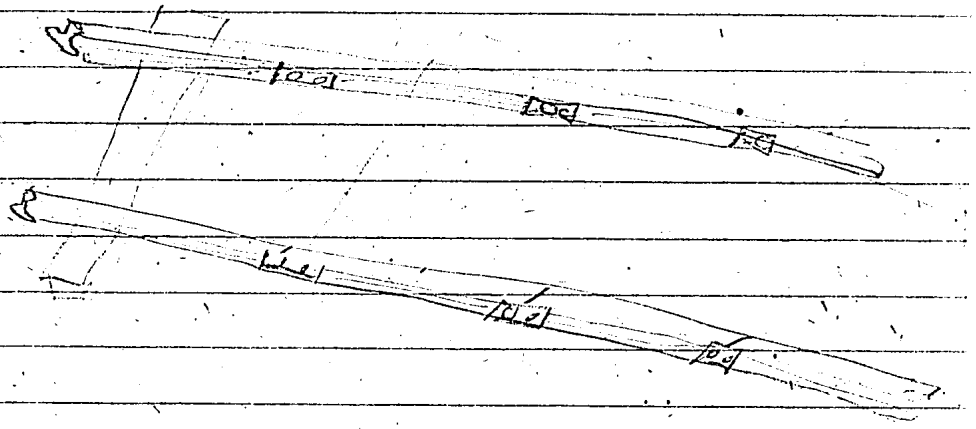


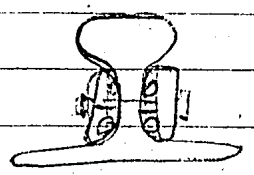

The fixings B are to prevent the cupbe from wedging X too tight against the clutch on chord & thus cutting it & also prevents X from turning.

Case No #67

application for patent filed

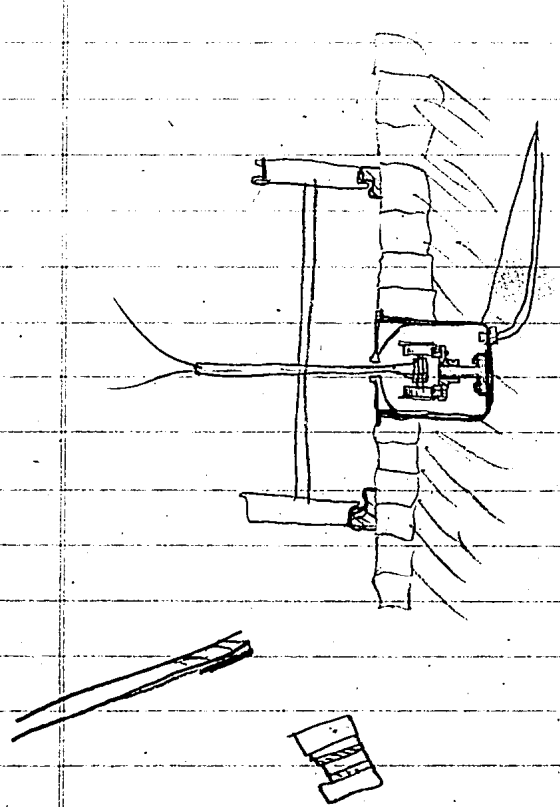
Aug 14/82



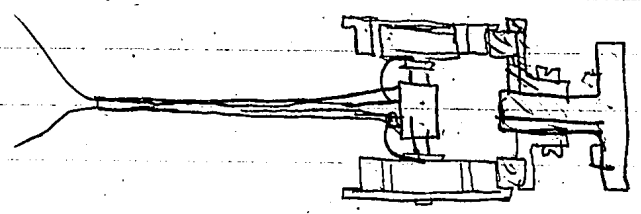


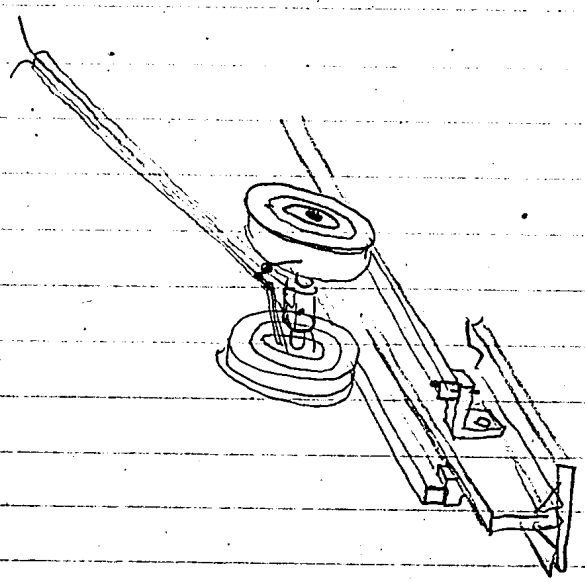
Case 4688

application filed Aug 14 '97



Case Hold
application filed Aug 14/87



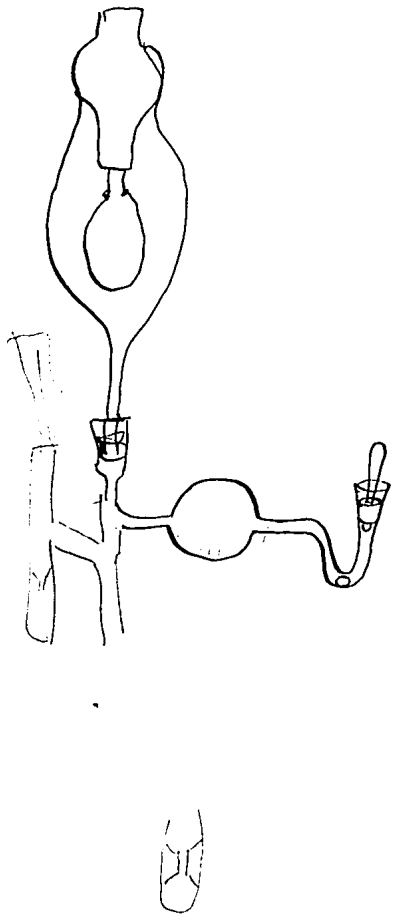


## Technical Scrapbook, Cat. 1149

This scrapbook covers the period January-December 1883. The entries are by Edison and relate primarily to electric lighting. Included are notes and drawings concerning lamps, generators, meters, regulators, electric power distribution, and other parts of the system. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney. The case number of Edison's patent application has been written on some of the items.

RICHARD N. DYER,
ATTORNEY AT LAW AND SOLICITOR OF PATENTS,
No. 65 Fifth Avenue,

New York City, 188



New York Jan. 2, 1883
Richard N. Dyer

Capsule
of gelatine,
Enclosing a volatile
compound such as
Carbon — by heat
the capsule is
melted allowing
the escape of the
liquid into the
Vacuum in the
proper quantity.
Collodion,
Tragacanth,
flour paste etc,
& other sub-

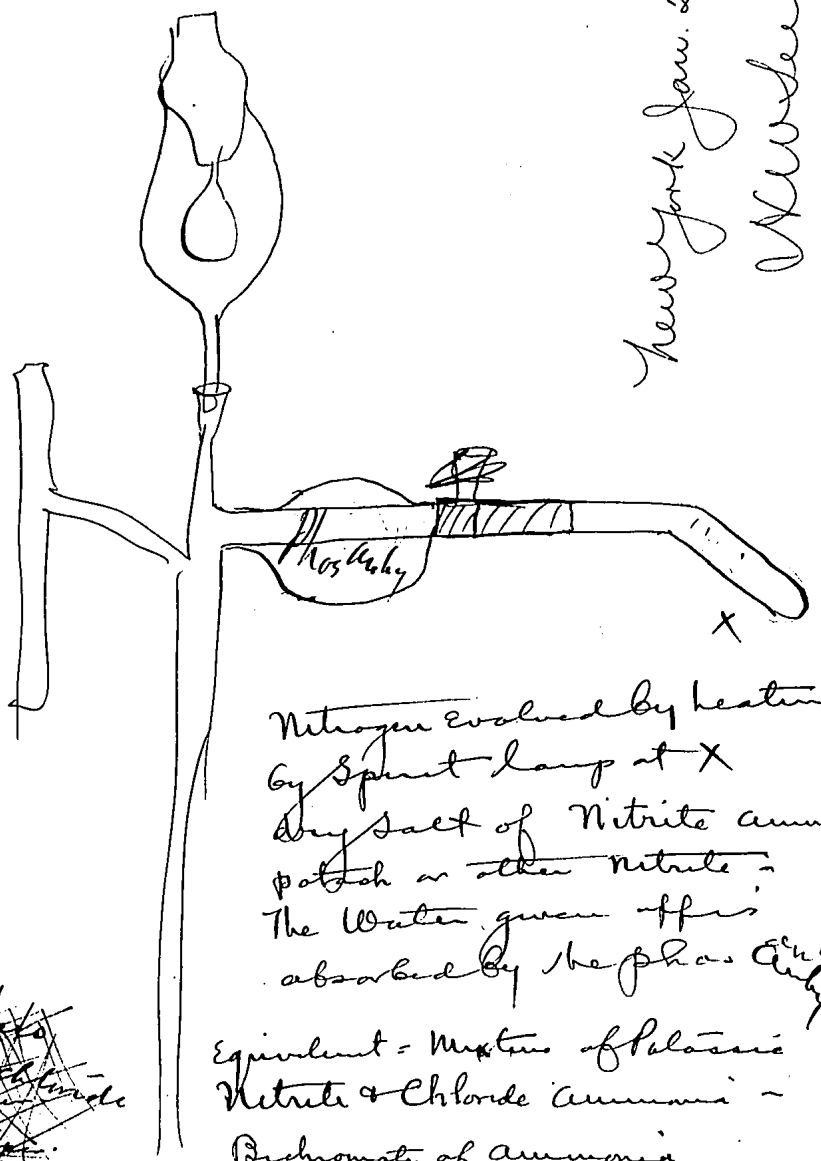
RICHARD N. DYER,
ATTORNEY AT LAW AND SOLICITOR OF PATENTS,
No. 65 Fifth Avenue,

Superiority Superior Superior Superiority Superiority Superior

New York City, ..... 188

New York Jan. 2, 1883

Wheeler

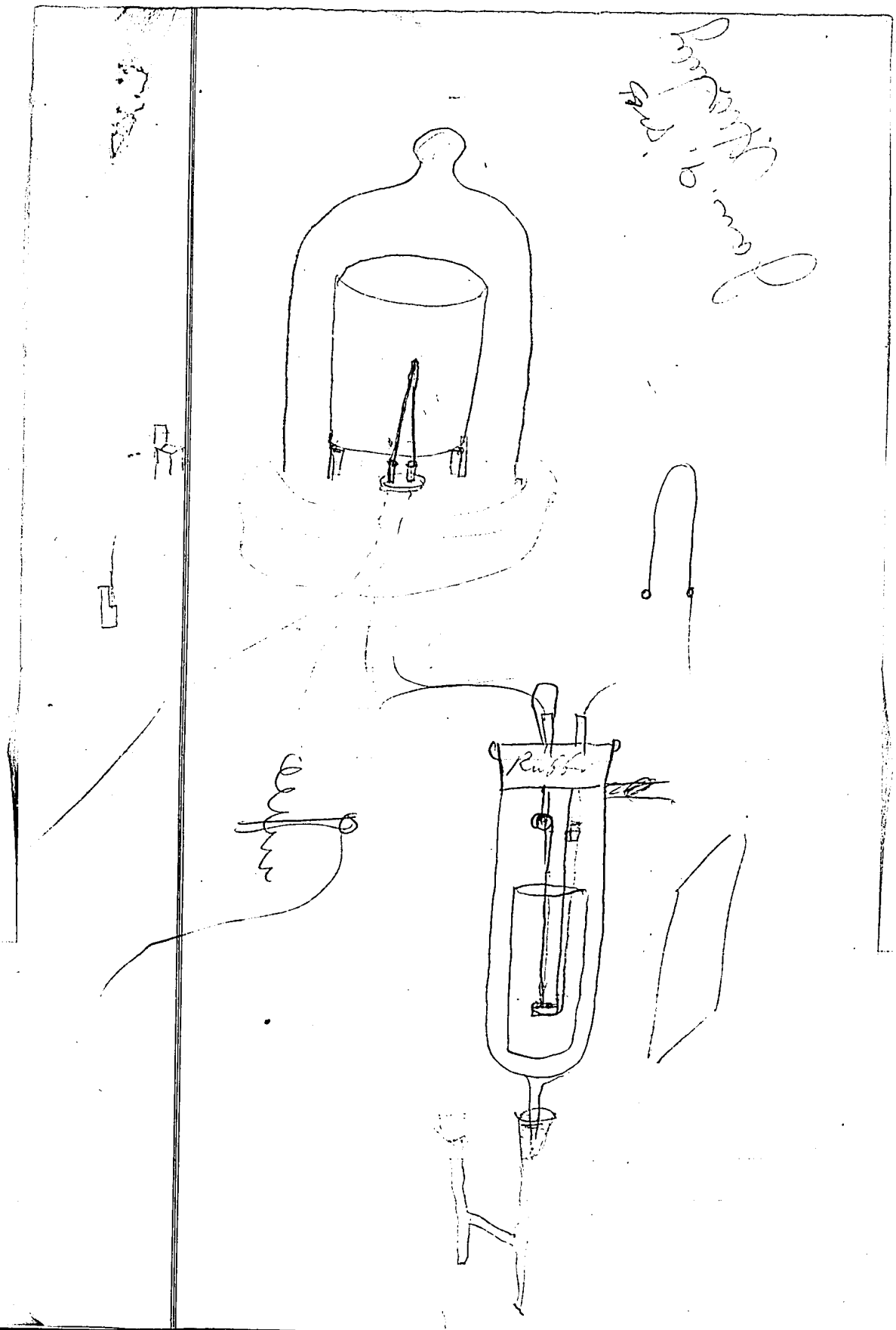


Nitrogen evolved by heating
by Spirit lamp at X
dry salt of Nitrite ammonia
potash or ~~other~~ Nitrite -
The Water given off is
absorbed by the phos Anhydride

Equivalent = Mixture of Platinic
Nitrite & Chloride Ammonia -

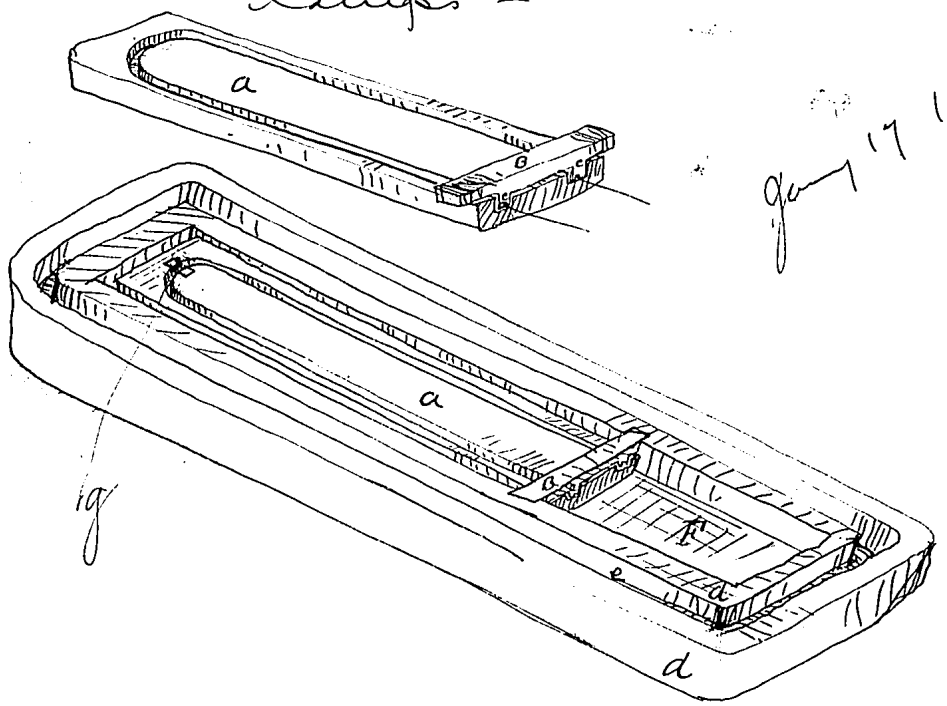
Bichromate of Ammonia
Nitrite of Chromium

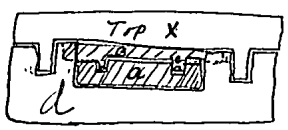
January 1883

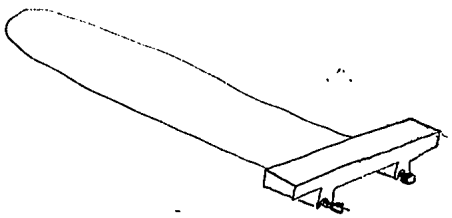


a is a long form with a groove ~~cut~~ moulded in it into which is laid the filament to be Carbonized. The ~~s~~ Ends of the filament are secured to the projecting pins c which are a part of the fixed Bridge B. the broadened or thickened End of the filament laying in a groove in the pins c The form a being movable as the filament carbonizes it contracts & pulls the form along the ~~space~~ The space being sufficient to allow for the whole Contraction of the filament & the form being successively heavy puts the right strain upon the filament in the act of Carbonizing. d is the mould. x The top = the object ~~of~~ of the double gutter being to prevent access of Oxygen which impairs the perfection of very fine filaments by oxidation. The whole you see is a regular closed Chamber & the number of these are laid one on the other & placed in a ~~Mass~~ Large Etc Seely See my application of Carbonizing in double plumbago moulds Etc ~~Etc~~ You will have to look at the other patent to get Claim

New Carbon form for Carbonizing delicate filaments of Carbon for Incandescent Lamps —



The object of the invention is to automatically maintain a balance or equilibrium in the number of Lamps between two Circuits

The invention consists in the Same

A.Y.B are double Electromagnets one magnet being placed across one circuit + the other across the other circuit, when there is the same EMF across the Terminals of Each circuit the Lever of the Electromagnet is so constantly attracted to that side which it had been previously attracted by reason of a Superiority of EMF - which in this position the lever + Contacts puts its multiple arc circuit of Lamps across say the No 1 Circuit now if No 1 circuit is weakened (10) the EMF falls due to heavy loading on that side, the magnet weakens across that Circuit and as the No 2 is unloaded in EMF the lever is attracted to the other side + thus throws the circuit of Lamps across No 2 raising the EMF of No 1 + lowering that of No 2 + by having say an automatic Governing device in Each 10th Lamp the moment any tendency of overloading one circuit occurs some of the automatic devices will throw Lamps from the circuit to the other side

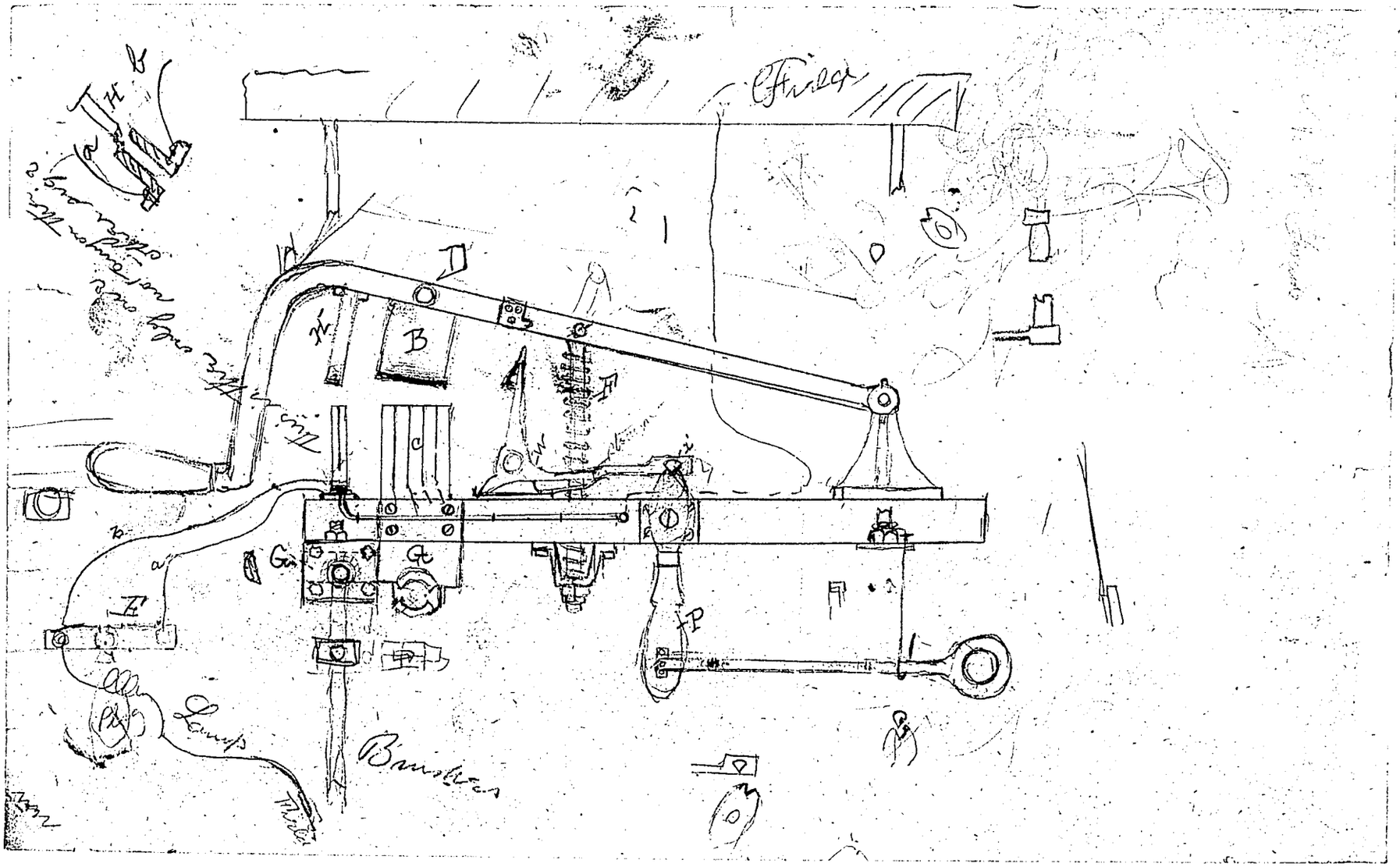
mutual equilibrium is attained - With these devices the cells were ~~not~~ used not pass to the solution but it is preferable & by which used the number of automatic devices can be greatly lessened, when there are a great number of Consumers the automatic device is of considerable necessity, but is valuable when there are but few Consumers & occasions arise when the currents are very much out of balance hence there is a large force of pressure in the Conductors & the higher the more great discrimination in the Conductors, & this is remedied by an automatic balancing device or Compensator,

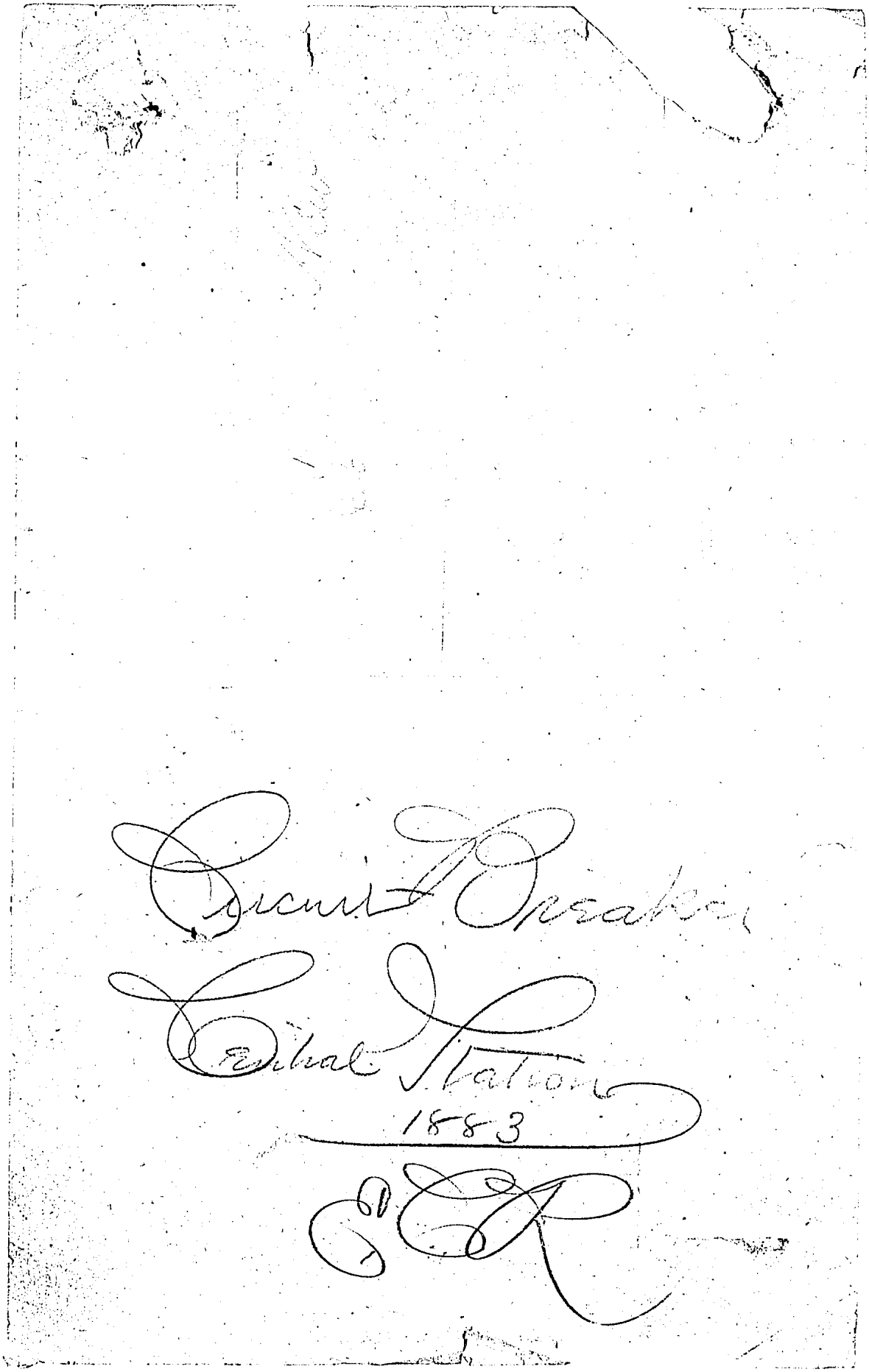
A clockwork to shift the currents of Lamps from one set to the other could be used, which is controlled by a differential magnet The Expansion of wire deflection of galvanic Expansion of bar mechanism controlled by magnetism, or electricity the operation could readily be used to effect the shifting of the Lamp Current, -

Seely make some brand

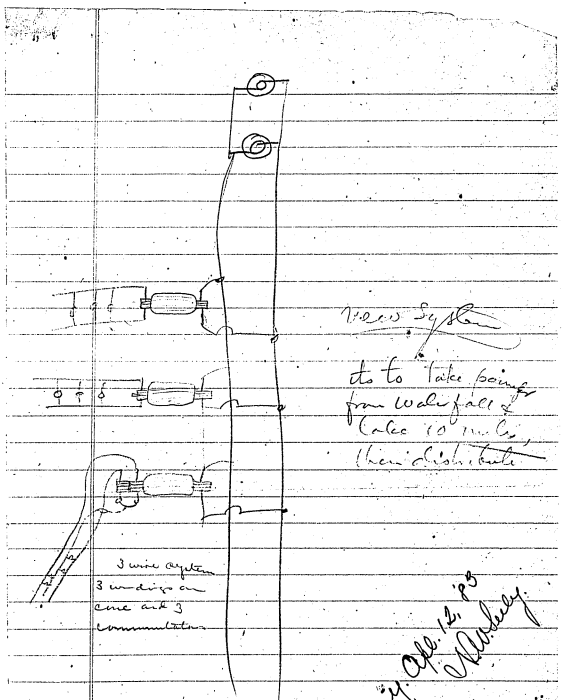
Clamps on this

Mich 4 1883 E


Frame
B
C
F
FP
Lamps
Banisters


Circuit Preacher
Ethel Station
1883

— April 1883 —




Dec. 12. '83

Case on process

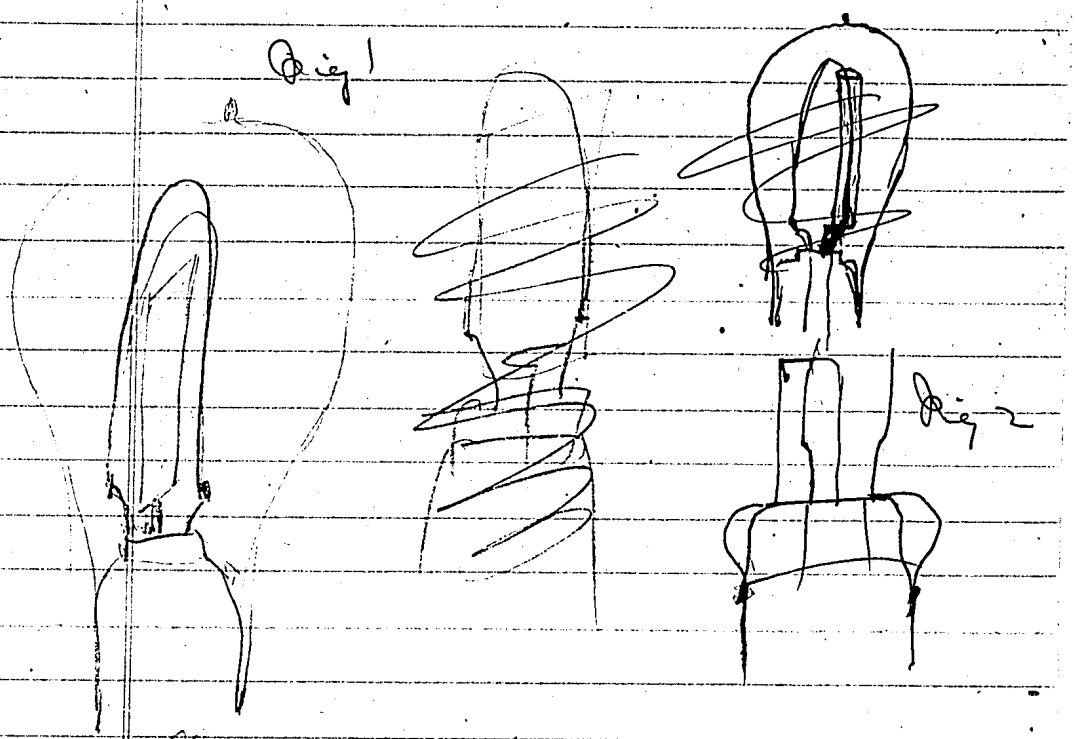
Filament first carbonized; then put in temporary vacuum chamber and sealed to [illegible] to heat it incandescently; then taken out and dipped in carbonizable solutions; then re-carbonized in furnace; then used in ordinary way.

Dilator at weak spots; no good unless set before dipping.

April 10, 83

Mershey

April 1883

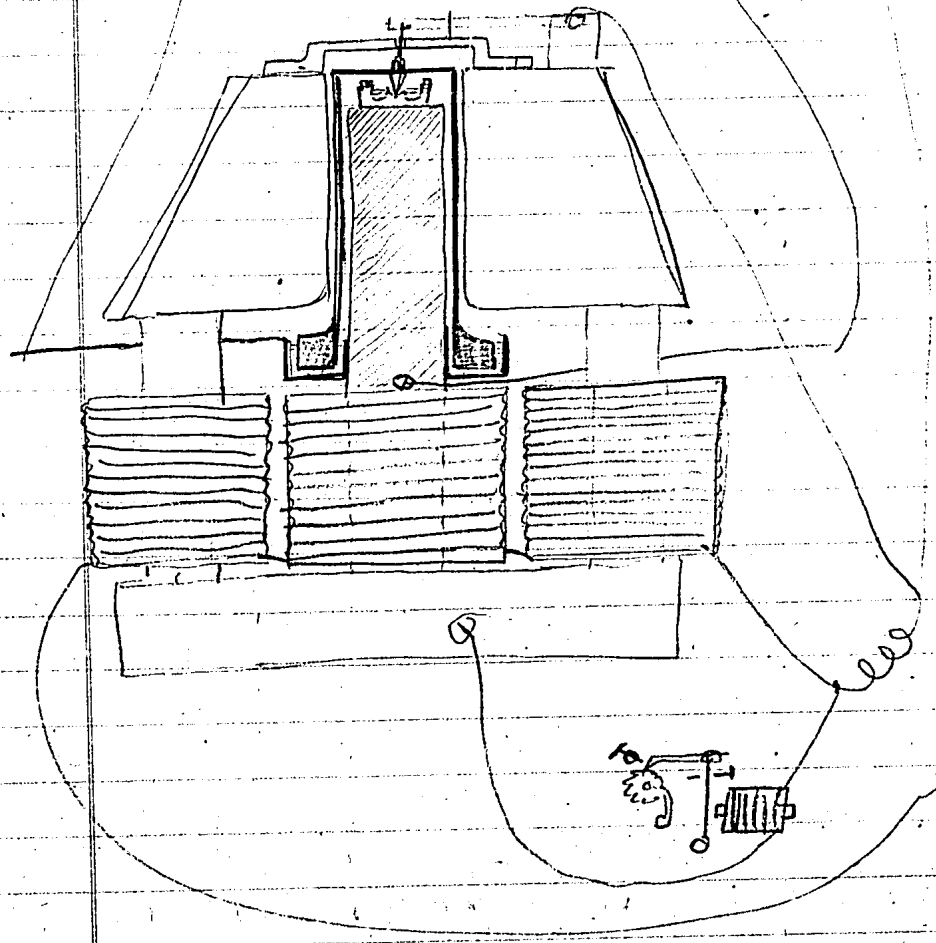


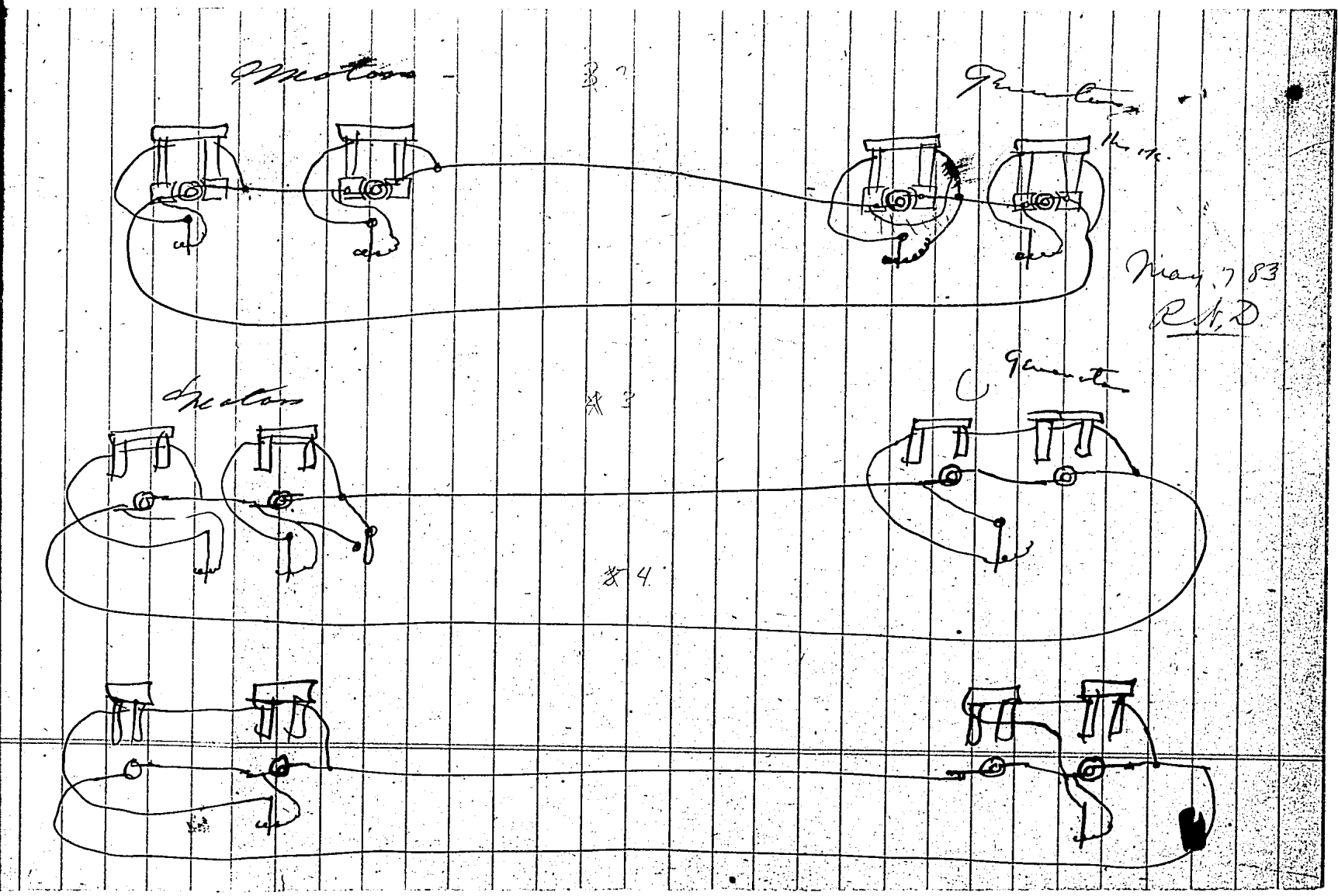

Carbon 10 — Fig. 3 — glass or mica platinum [illegible] of carbon of glass tube around one link.

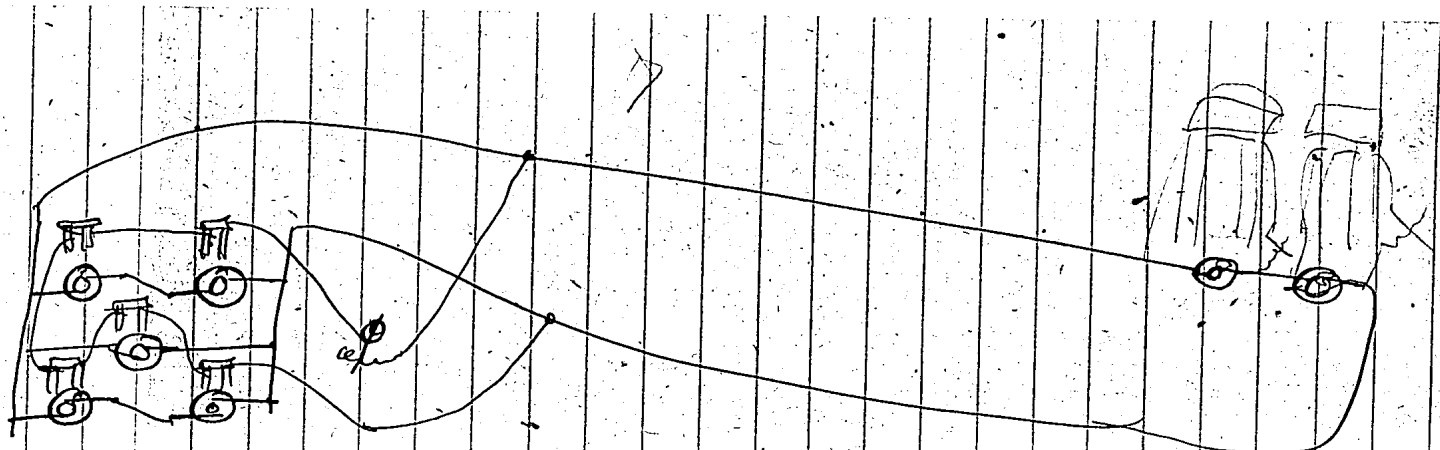
Prepare abst.

Oct. 2, 83

Fig 65

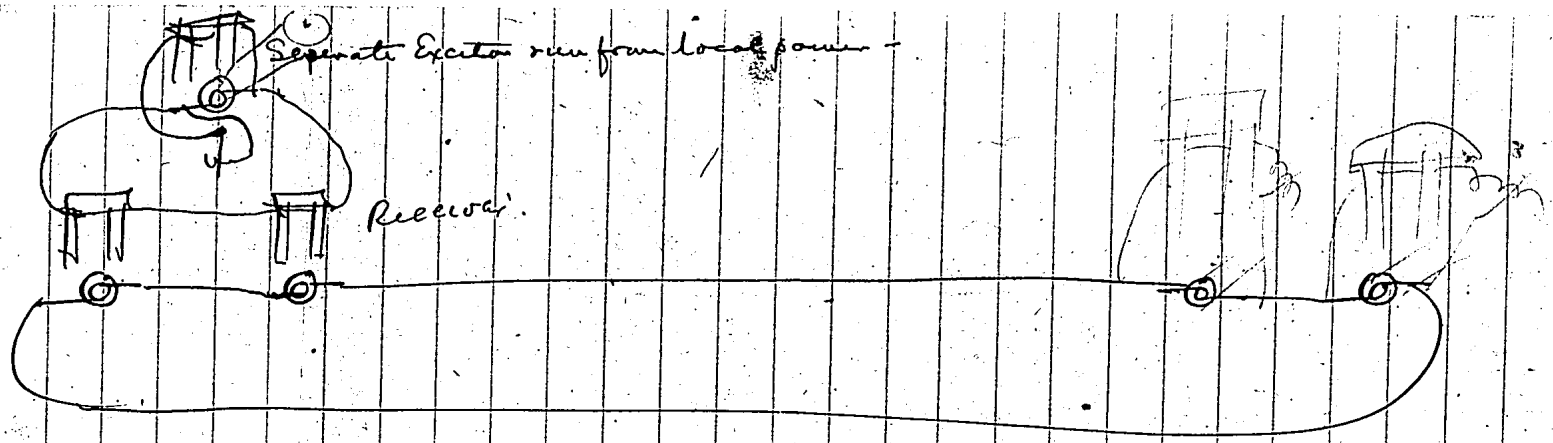



#3
#4
May 7 83
R.H.D.



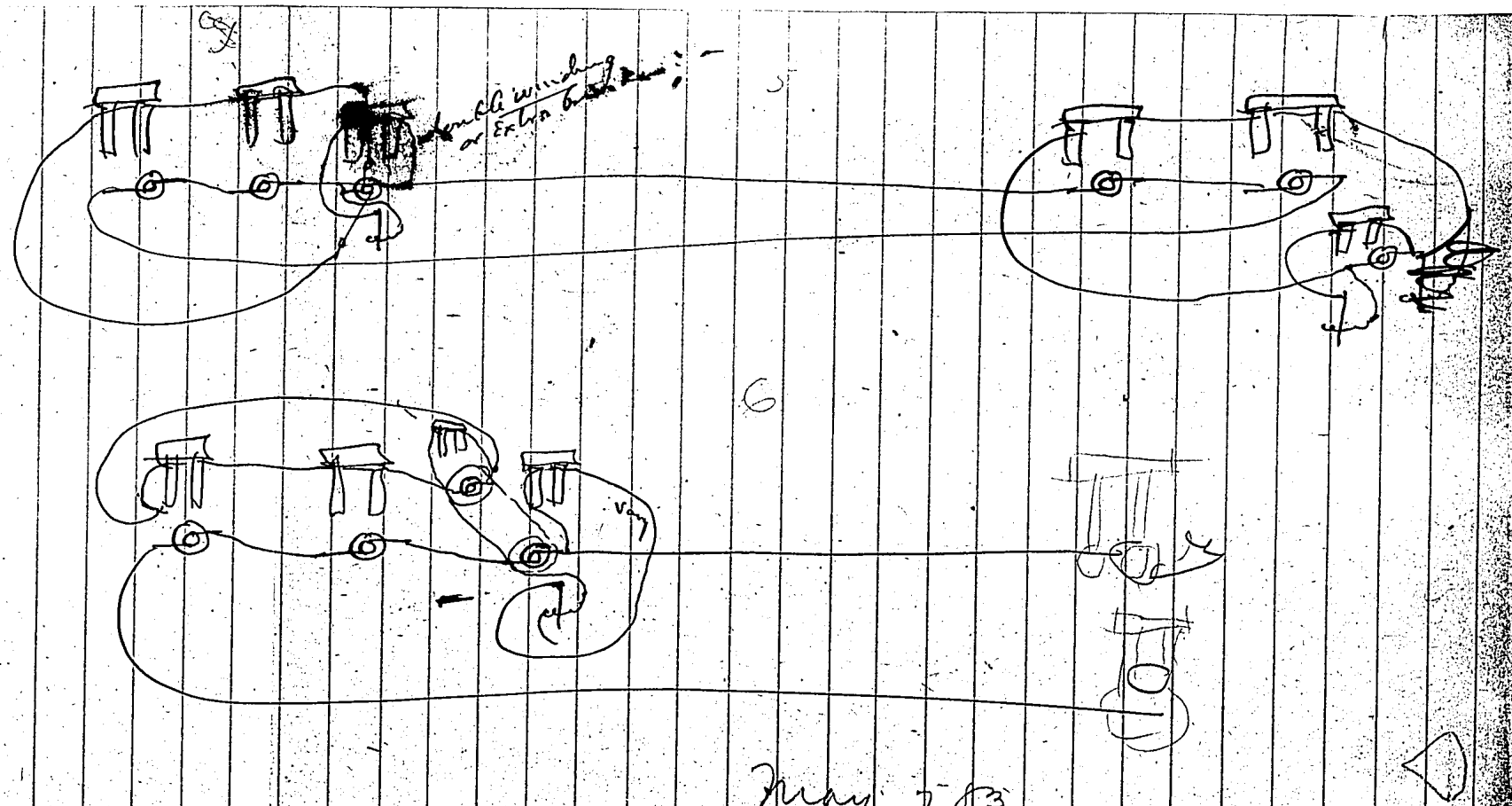
May 7 83

R.A.D.

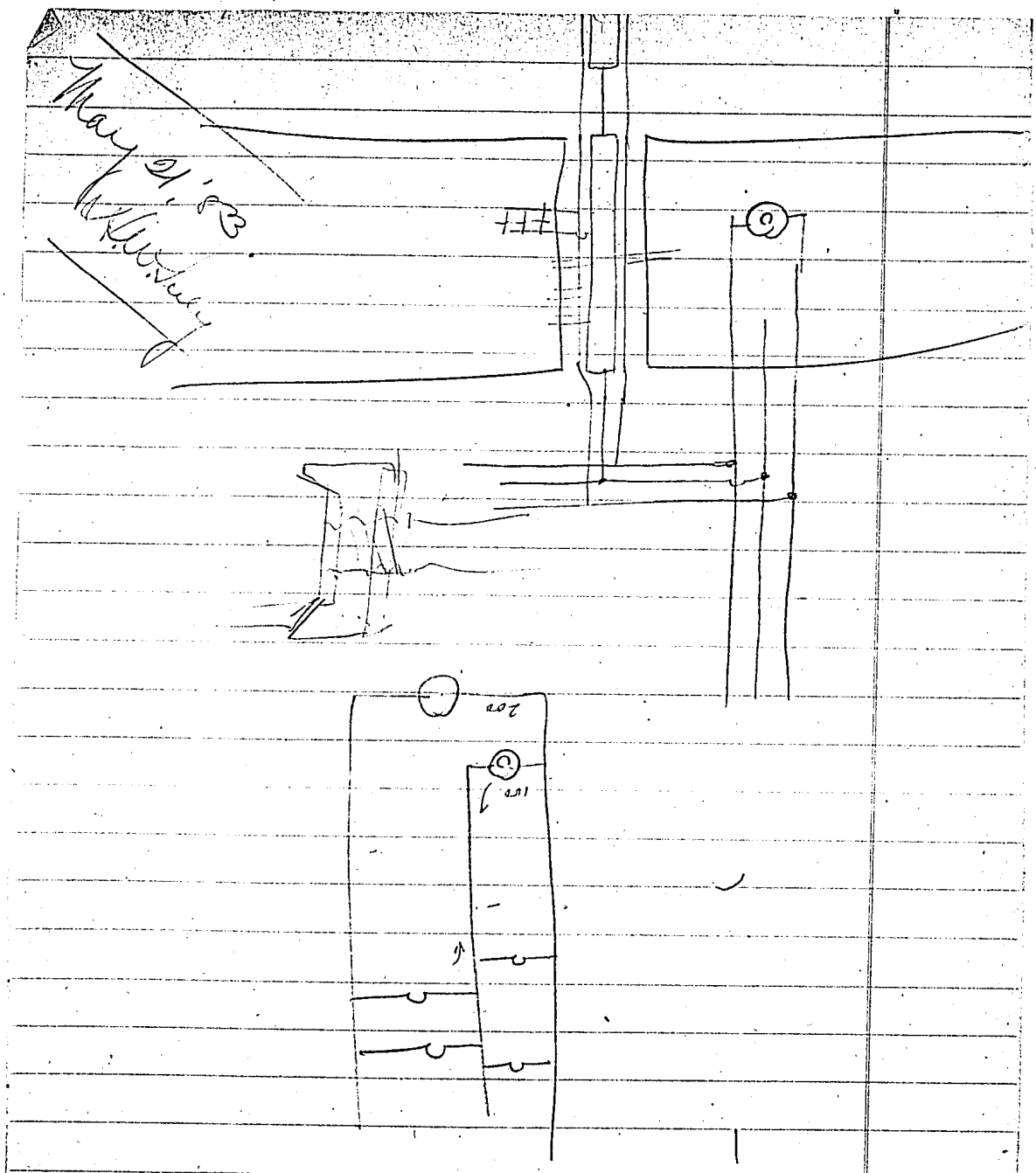


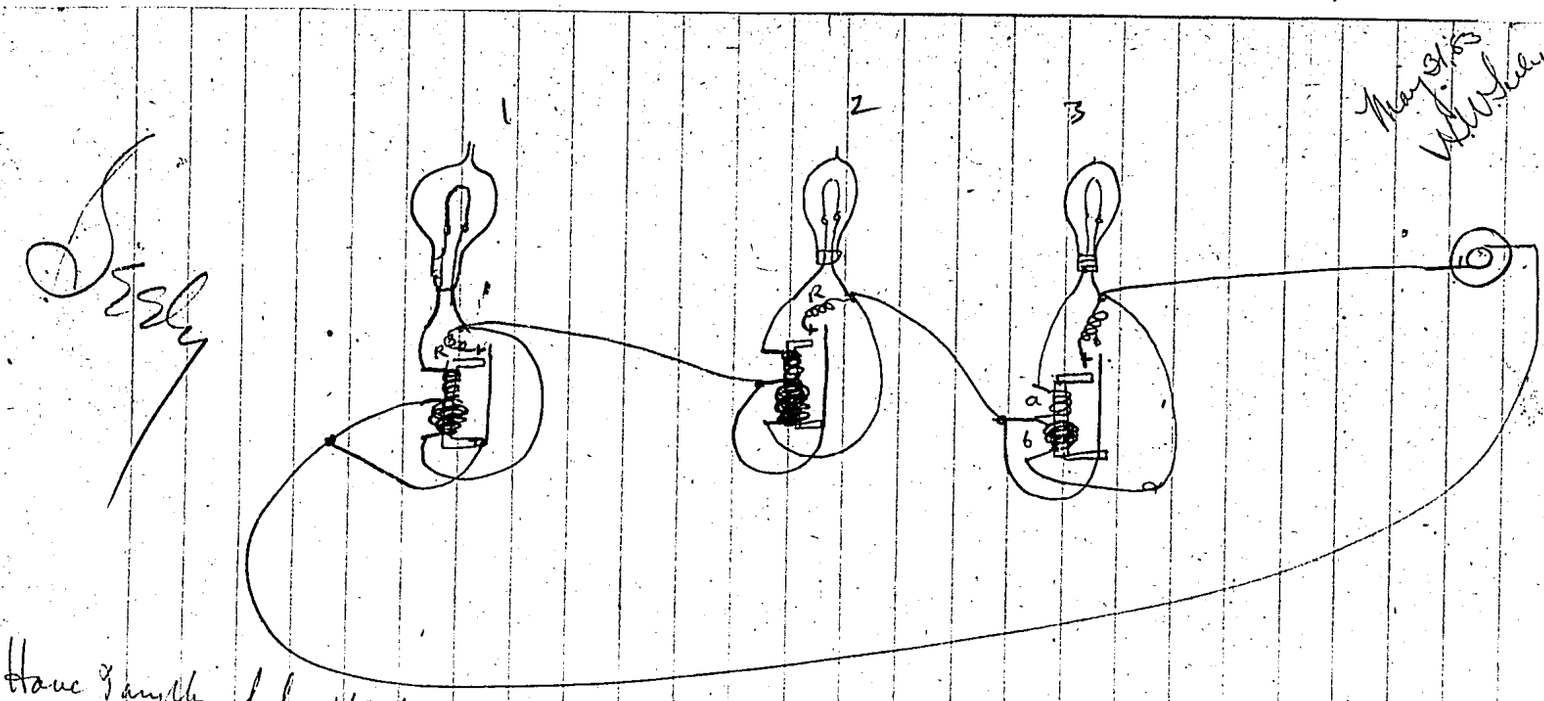

May 7. 83

R.N.D.



May 7 '83






May 31/83
W.W. Story

Have I anything like this.

Deffential wound magnets when lamps of the Current in low res coil a balance the magnetism produced by the Current in the fine wire b. R is a low resistance or it may be another lamp — When the lamp 1 2 or 3 breaks the differential coil is discharged the armature of the magnet is attracted & the ~~short lamp~~ Coil R is thrown in Ckt —

E ~~W.W. Story~~ May 31 1883

To 2

(1)

The object of this invention is to produce a cheap and reliable meter for measuring the Electric Current or Energy in a ~~~~ system of general distribution of Electricity for Light Heat & power

The invention consists in combining a peculiar Constructed Electrometer with the line upon which the Current is to be measured & providing such meter with proper Counting or registering apparatus and also devices for causing the meter to perform a definite amount of work.

~~~~~~~~~~

Fig 1 shows a section of the meter -
B is the iron base which forms the back of the Electromagnet
C' being one pole & C² C³ forming with the End piece E F the other pole
C' C² C³ are ~~~~~~~~~~
Coils of wire D' 2 & 3
& are all placed in one circuit
& this circuit forms a multiple arc circuit across the mains
Connections upon the Consumers
~~~~~~~~~~

The direction of the current is such E E are positive which C' opposite is negative; thus the lines of force pass from C' to E from the Entire Circumference of C'

On the Cap of C' is a depression with a Graving into which a pivotal point S rests, the depression is partially filled with Mercury. The point S is made of platinum or platinum Iridium alloy so as not to amalgamate with the mercury in the depression, the Mercury being used to make good & sufficient Contact with the revolving pivot to carry without heating a powerful Current

F is a Copper cylinder to which the pivot S is secured This cylinder is shown in fig 2 at the bottom are secured paddles of platinum ~~[illegible]~~ which rotate in the circular trough E fig 2 which is partially filled with Mercury which dips both to make Electrical Contact with the cylinder which is to be recalled upon

its pivot S. and also to cause a definite amount of work to be done by the cylinder in the act of rotating.

Another bearing N supports the Extension of the pivot S. marked T. upon the Extreme End of T is a worm which acting upon a worm wheel Q gives motion to the train of wheels which serves to register or indicate the number of revolutions of the cylinder F. Becomes as the Counter used on a gas meter the revolutions being proportionate to the strength of the Current Instead of a worm & worm wheel the rotating cylinder & shaft may at Each revolution close momentarily a local circuit & Energize an Electro magnet which serves to give motion to the indicating mechanism. There is shewn in fig 4. T is the shaft W a point. P a platinum tipped spring. R a limiting point. at Each revolution the point W comes into Contact with the spring P & closes the Circuit

4 to the magnet X.

The method of connecting the mechanism to the line is shewn in fig

L are the mains of the street
P N the mains in the house;
Wire 1 runs to R R which is a resistance coil. Thence to the helix D' thence through helix $D^2$ thence through the helix $D^3$ back by wire 2 to the other pole

Thus keeping a current constantly circulating around the coils of the field magnet —
The main line passes by wire 3 to the meter m.E thence up through the cylinder around its whole circumference to the point S down through the iron core C' to the base thence by wire 3 to the lamps —
When no lamps are in circuit only the field magnets are energized but the moment a lamp is placed across the circuit

5

or pole a powerful Current passes through the meter as described & causes the Cylinder to rotate (now a 2nd Lamp be placed across the pole thus as much Current passes & the speed of rotation of the cylinder is doubled In fig 5 The Electrical Contact method of working the indicating apparatus is shown the shaft T in rotating makes momentary Contact with P once every revolution This closes a local circuit around the Resistance RR. in which circuit is the Magnet X.

That the rotating shell may so perform work in that the Current is directly proportional to the rotation, the paddles upon the cylinder must be arranged in a proper manner, & retarding pieces may in some designs be found necessary. The retarding pieces being constructed permanently with the circular trough so as to prevent the mercury rotating as a whole - again during

to the large size of armeter & the consequent large initial friction of the parts, it may be necessary to make the paddles connected with the cylinder loose but so arranged as to be thrown in or out of the mercury more or less so as to cause the rotations of the shell to be directly proportional to the strength of the current.

It is not necessary that the shell should rotate as it may be held still & the magnet rotate as in fig 6

~~Even the magnet may be a permanent~~

Even permanent magnets may be used & Electromagnets dispensed with,

To prevent waste of Electrical Energy by keeping the field coil magnets constantly charged when there is no Lamps connected, an Electromagnet may be placed in circuit at X which having a lever & point

may serve to close the same when a lamp is connected, the points & lever being interpolated in the feed of the circuit. The circuit is opened by the magnet only when there are no lamps across the line.

Thus by the use of a non commutator motor or rather monodynamic motor I am enabled to convey powerful currents through the apparatus without loss by metallic or multiple contacts and also to obtain slow rotations with powerful currents; and at the same time attain the result with exceedingly small ~~undefined~~ friction ~~these bearings being~~ ~~other than that provided~~

It is not essential to have an Electromagnet field as the rotation of the cylinder will take place if a steel plate is used as in fig 7. but by the use of iron a much less current is required to perform the work =

Claim.

A monodynamic Mator substantially as described

A monodynamic Mator sub as described for giving motion to recording or indicating apparatus.

A monodynamic motor sub as described having its moving or inductive parts interpolated in the circuit with the translating devices, and a constant magnetic field produced by the action of the Current from a multiple arc ckt across the line,

A monodynamic Mator without a Commutator interpolated within the circuit the Current of which circuit serves to measure in Combination with a magnetic or electric field of force, and recording or indicating apparatus.

a monodynamometer arranged to perform a known & definite work in excess of the ~~f~~ normal friction of the motor & actuated mechanism so as to cause the number of revolutions of such motor to bear a known relation to the strength of the Current,

The Combination with Electric Lamps worked in multiple, with the motor in the omnibus wire of all the Lamps.

The use with a monodynamic Motor of a Contact whereby at each revolution 1 or more closings of a separate circuit is made such circuit Containing an Electromagnet actuating recording or indicating Mechanism. —

The Combn with the monodynamic Motor of worm & worm wheel,

The Electromagnet in main Circuit closing when lamp put in to close the feed circuit,

10.

Mention my other patents where Commutator used + dynamo; difficulty ~~mk~~ multiple circuits without great friction + wear parts + heating + ~~necessity very low~~ resistance in coils difficulty attaining sufficient low resistance Etc —

We tried this at Laboratory + it notch about once a month with 1 Lamp on —

Be sure + get this patent upon ~~your~~ shape by my return Thursday

April 1 1883

Fig 4

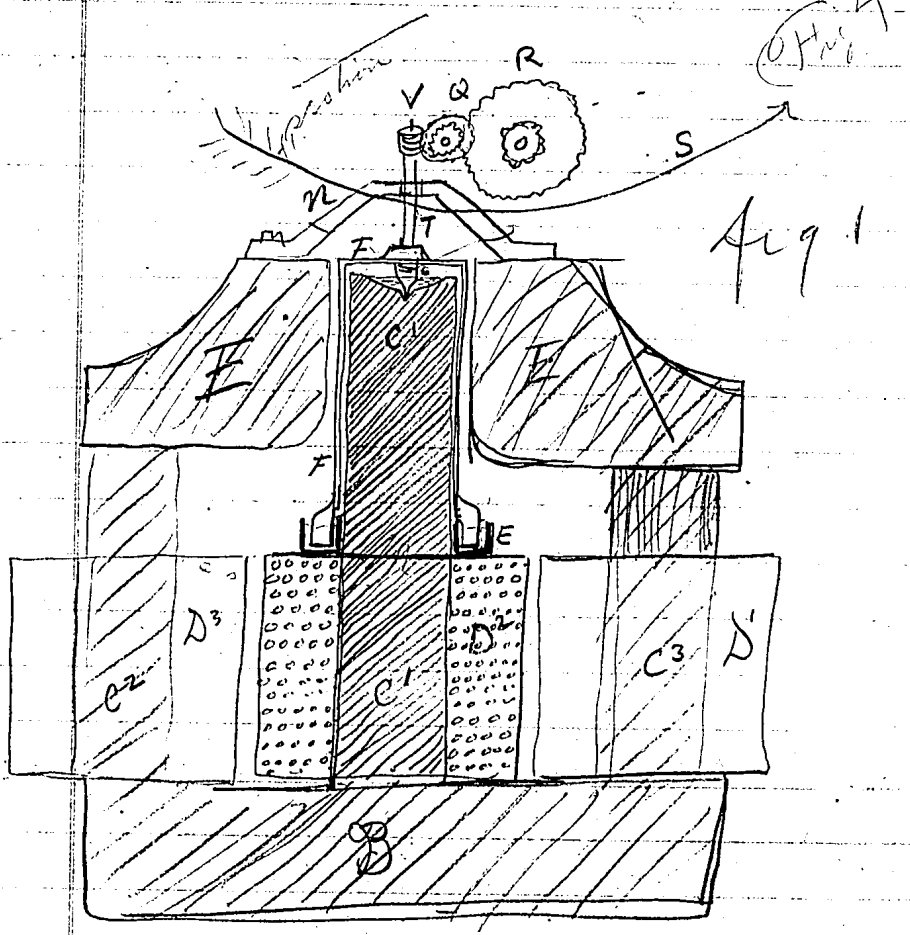



Fig 1

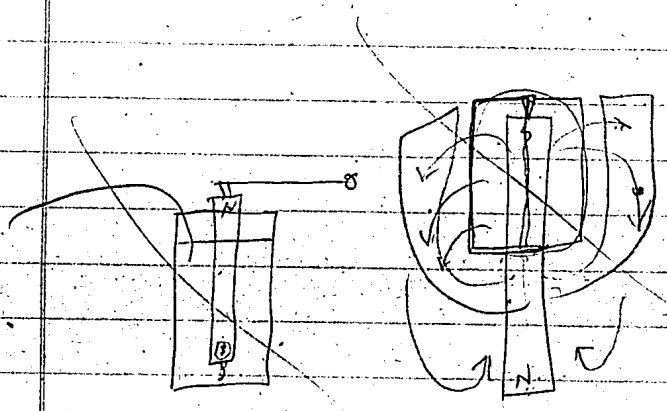
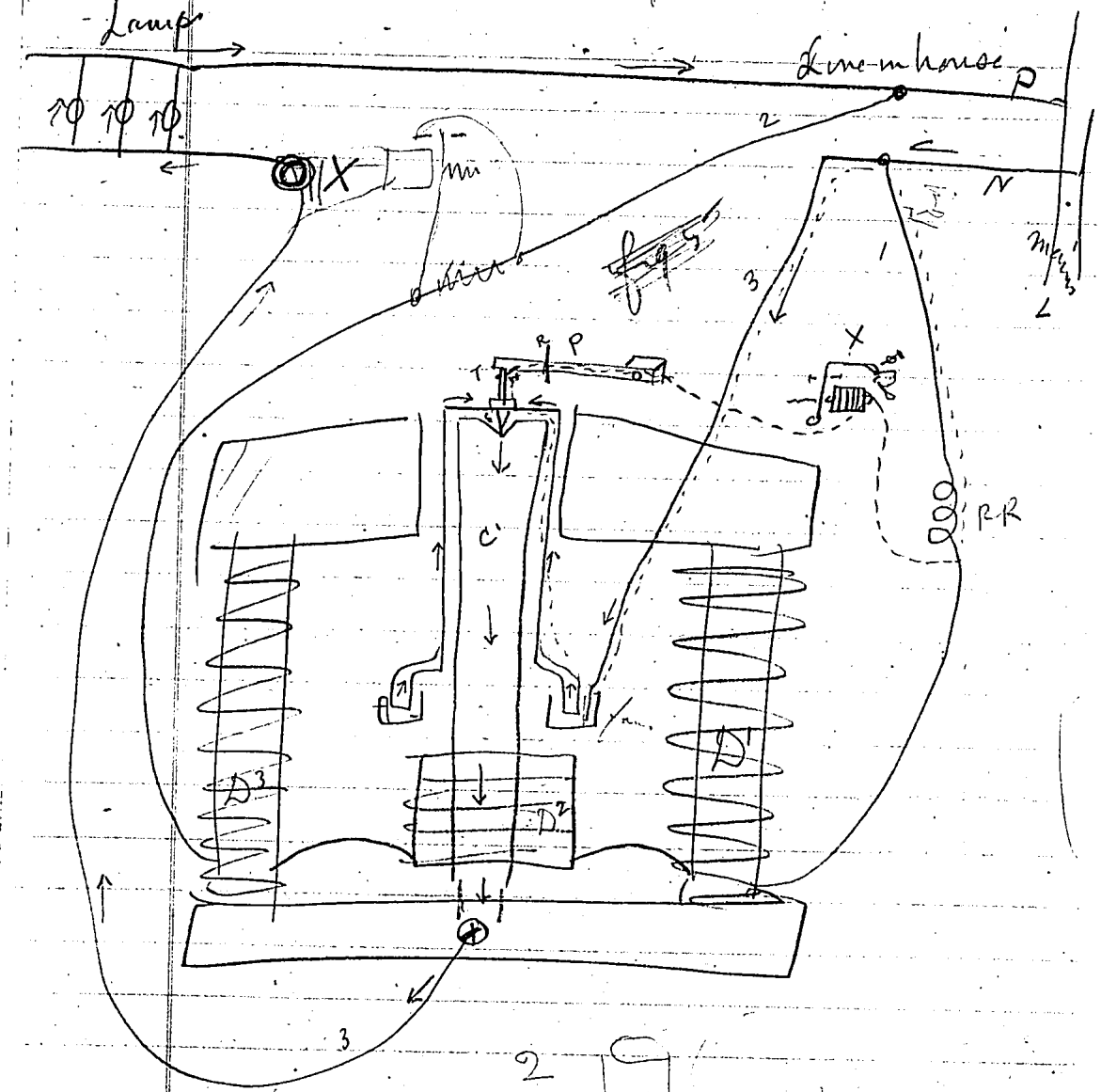


Fig I




Connections of the motor

The Constant field is taken across the house mains in multiple arc. The resistance of the Constant field magnets is very high so that only sufficient Current to Energize the field is used —

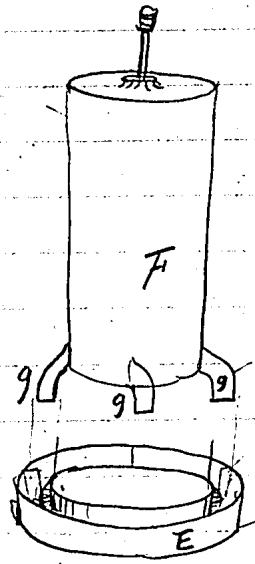



fig 2

platinum parallel wire

trough containing mercury into which small glass trough may be made of insulating material or metal not amalgamated by mercury

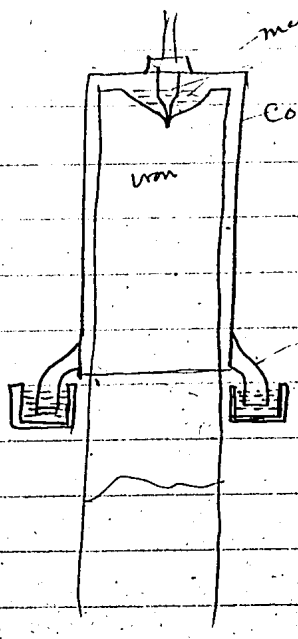
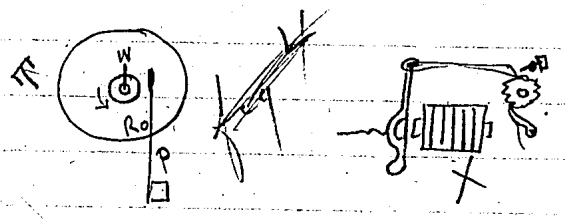


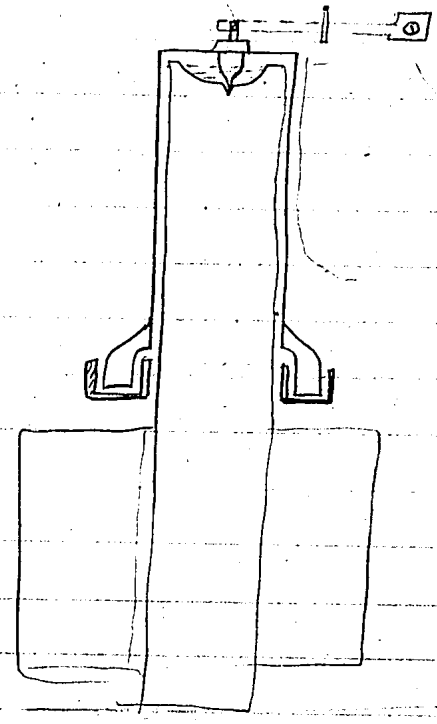

fig 3

platinum wire

Fig 3

Electrical Contact made Every revolution;



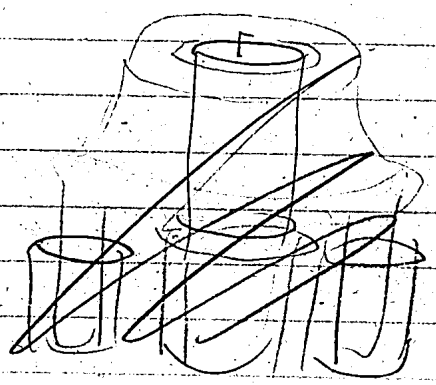
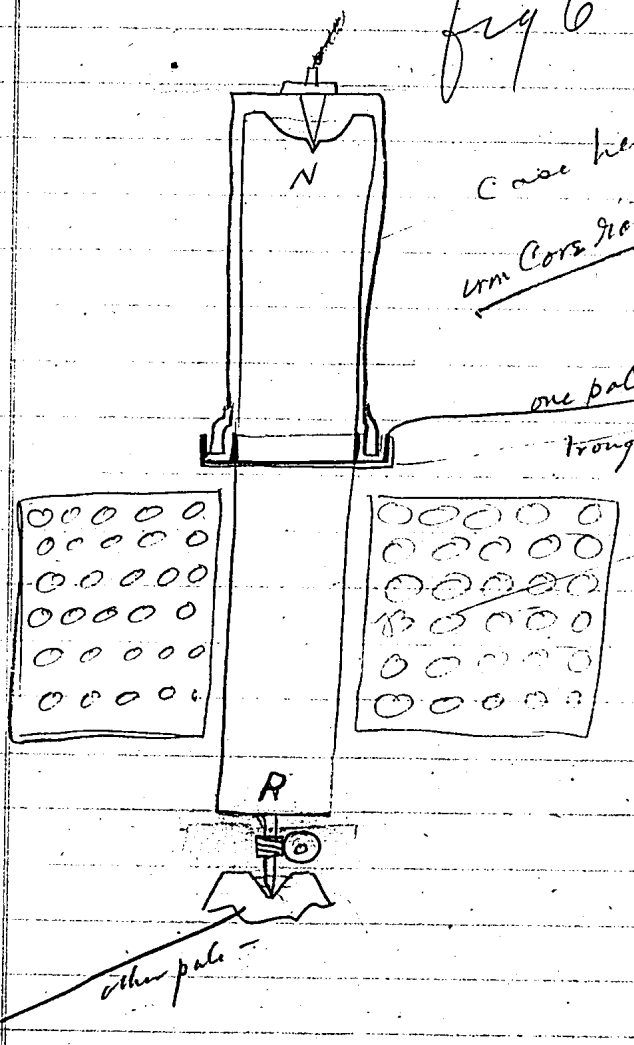


fig 6



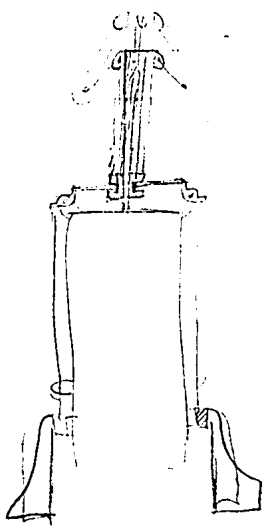

Coil head shell

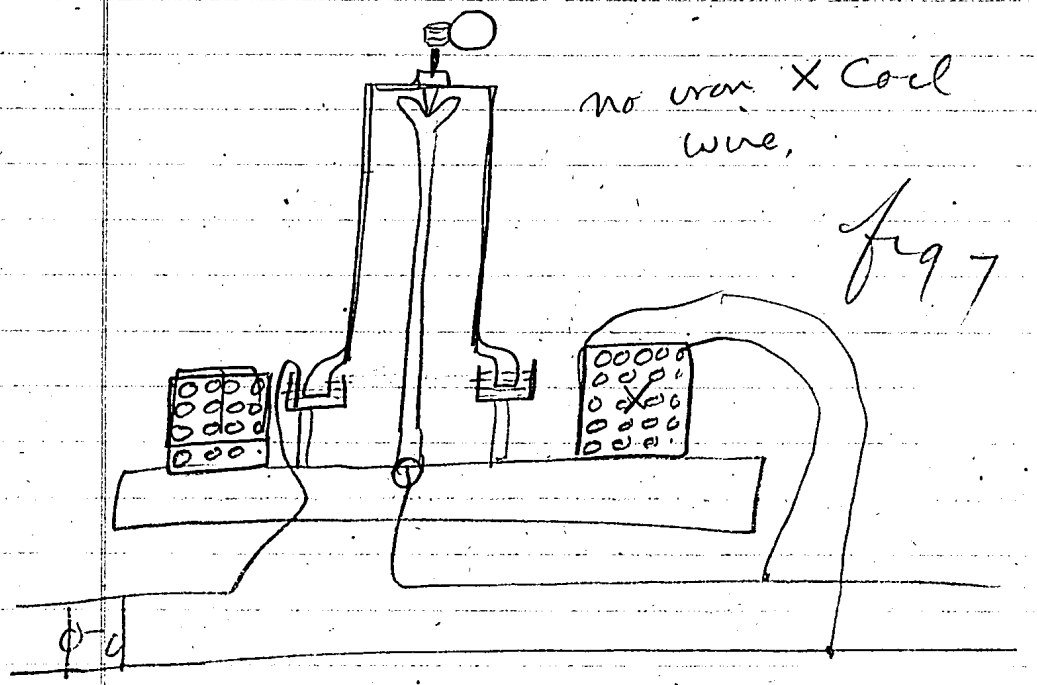
iron Core rotates

one pole

trough rotates with core

Fig. 1




no iron X Coil
wire,
fig 7
ϕ-d

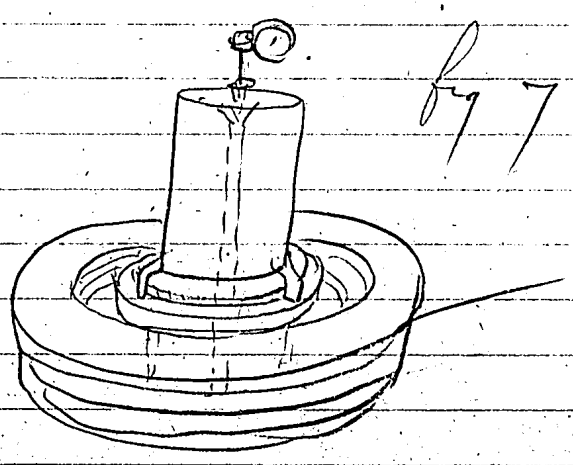
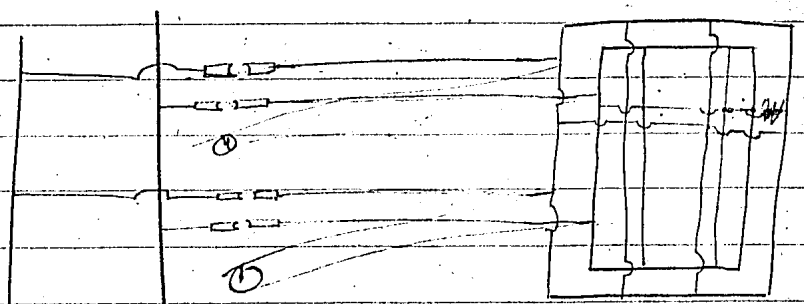


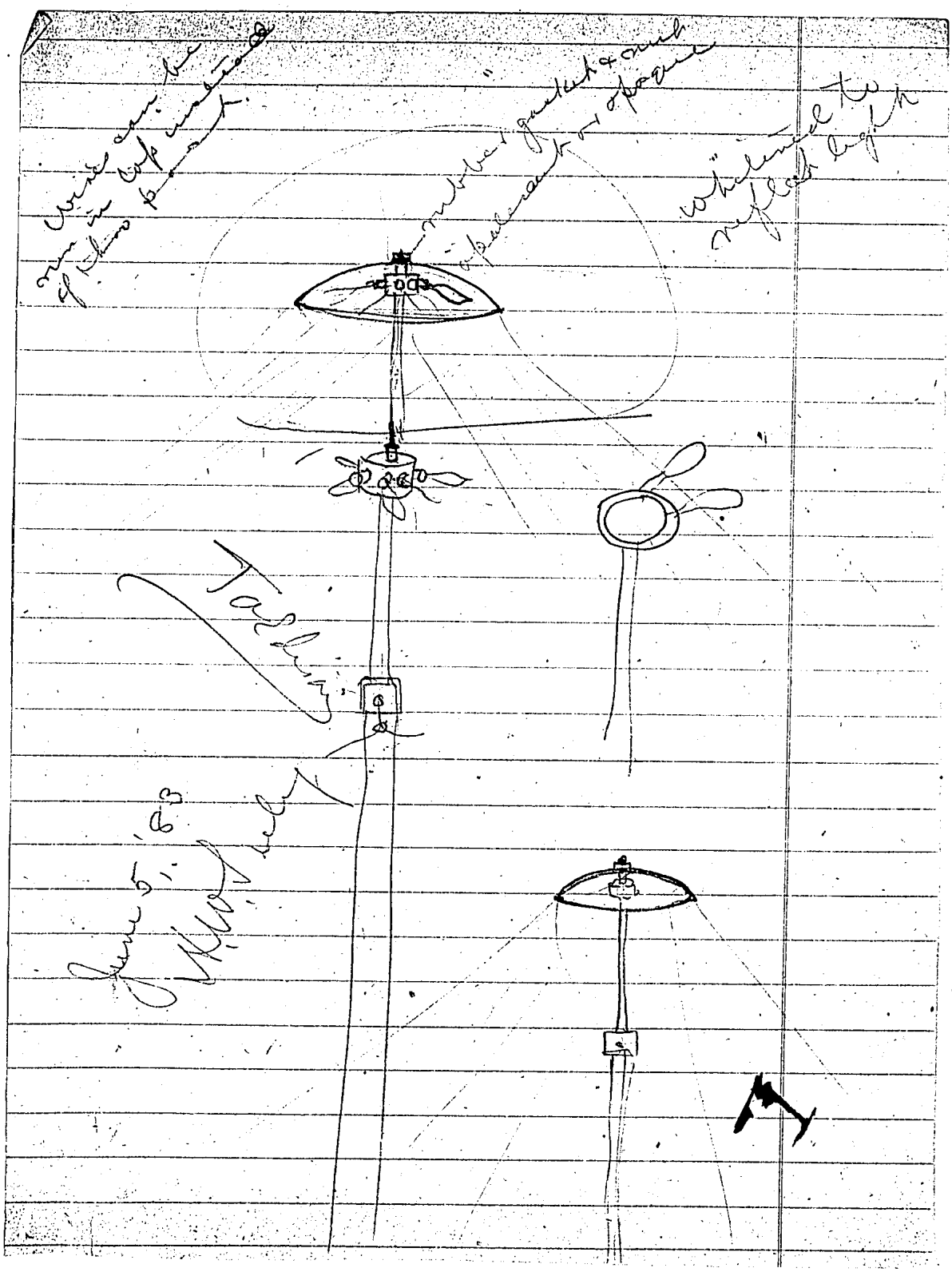
fig 7



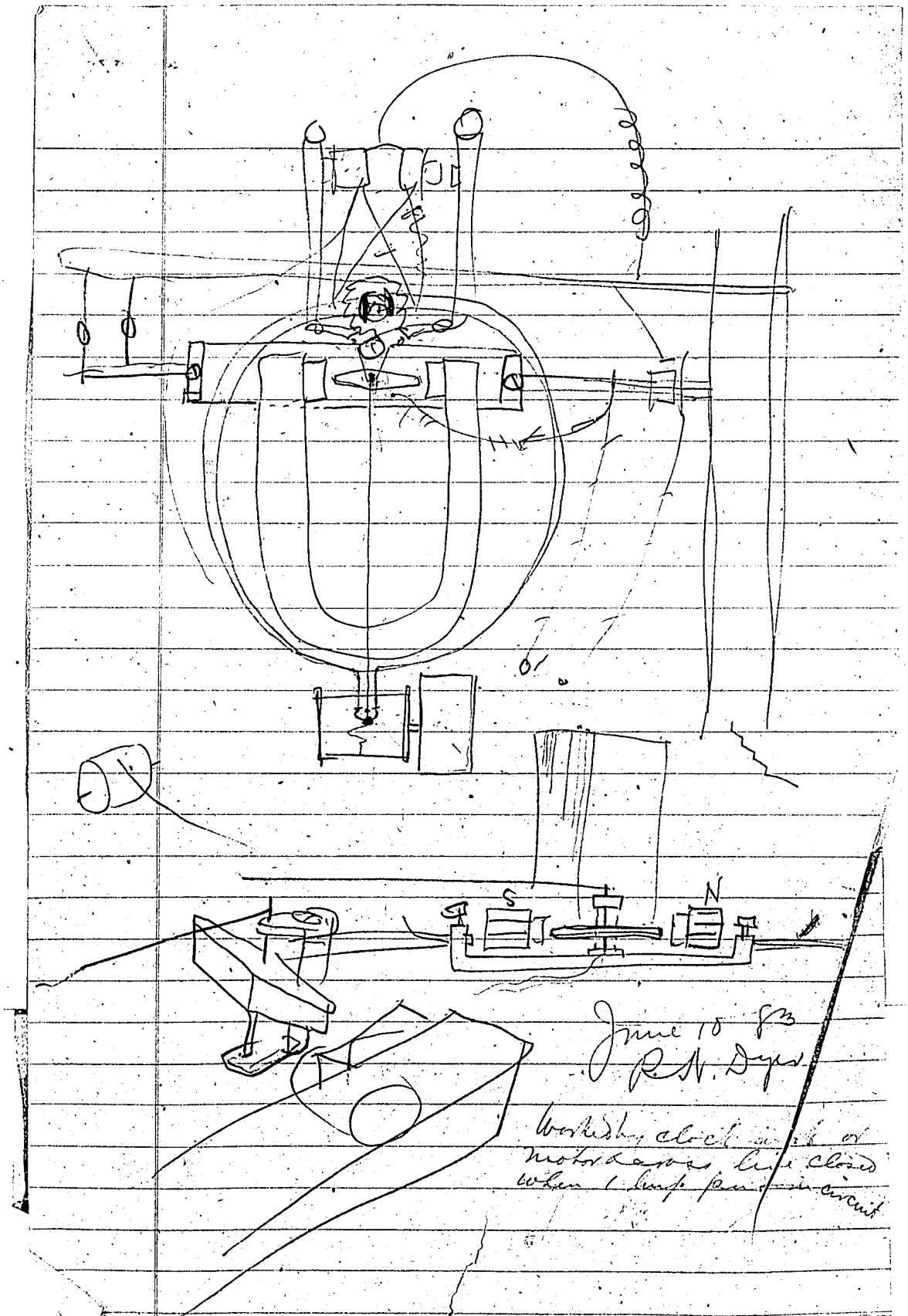
Case on regulating by breaking or closing all the part of feeders

Plug in each conducted of feeders

June 5, '83

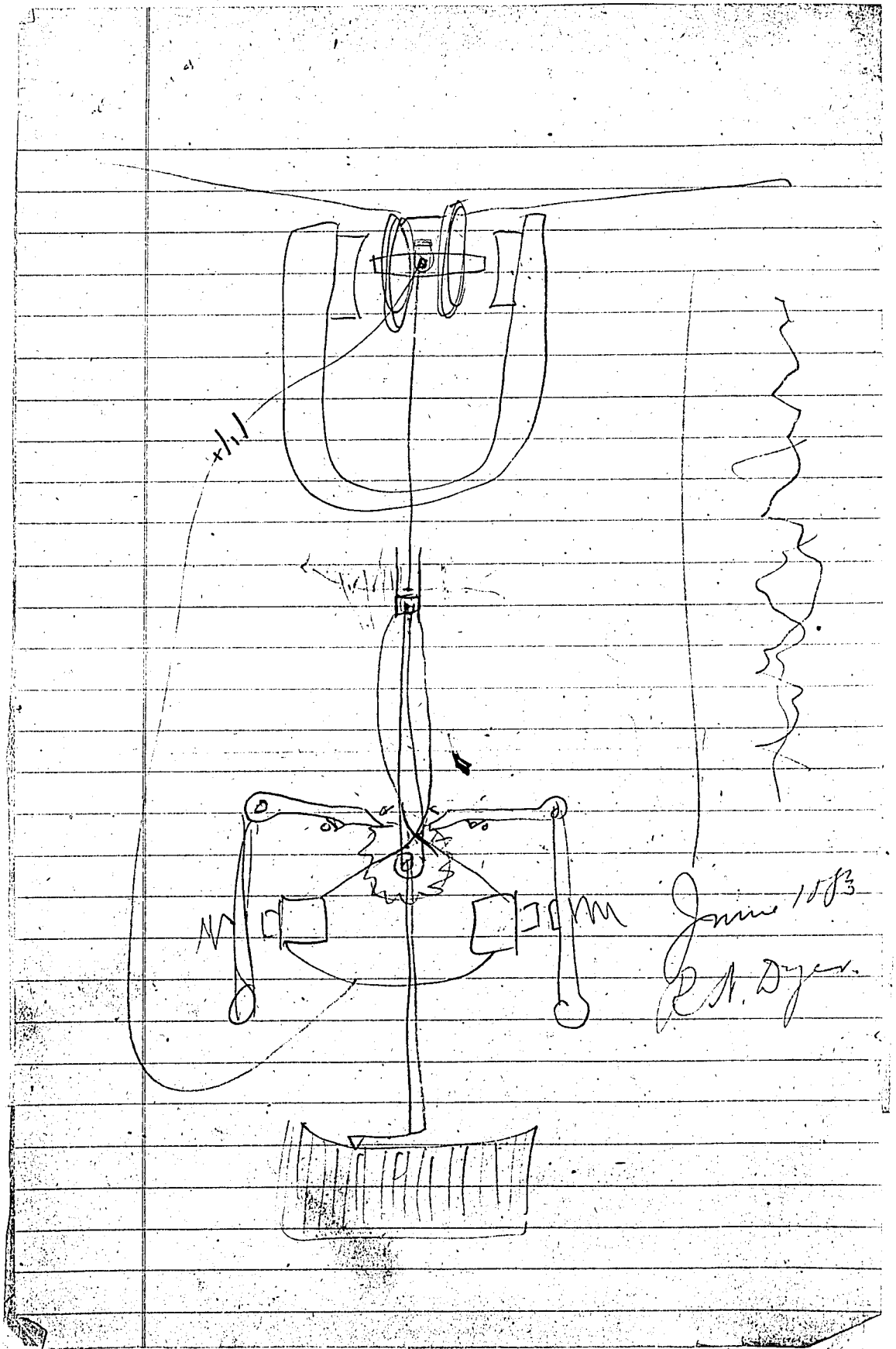


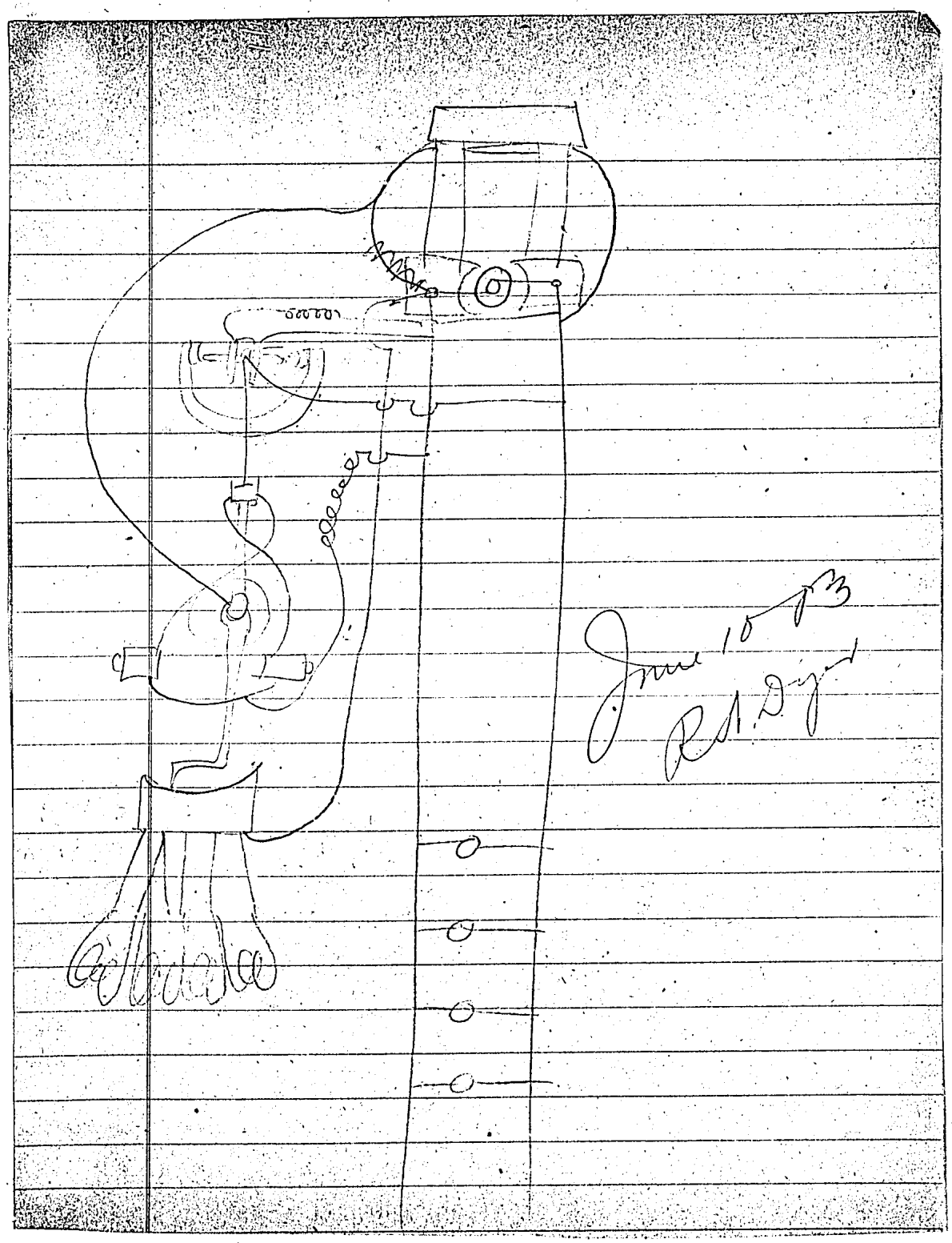
June

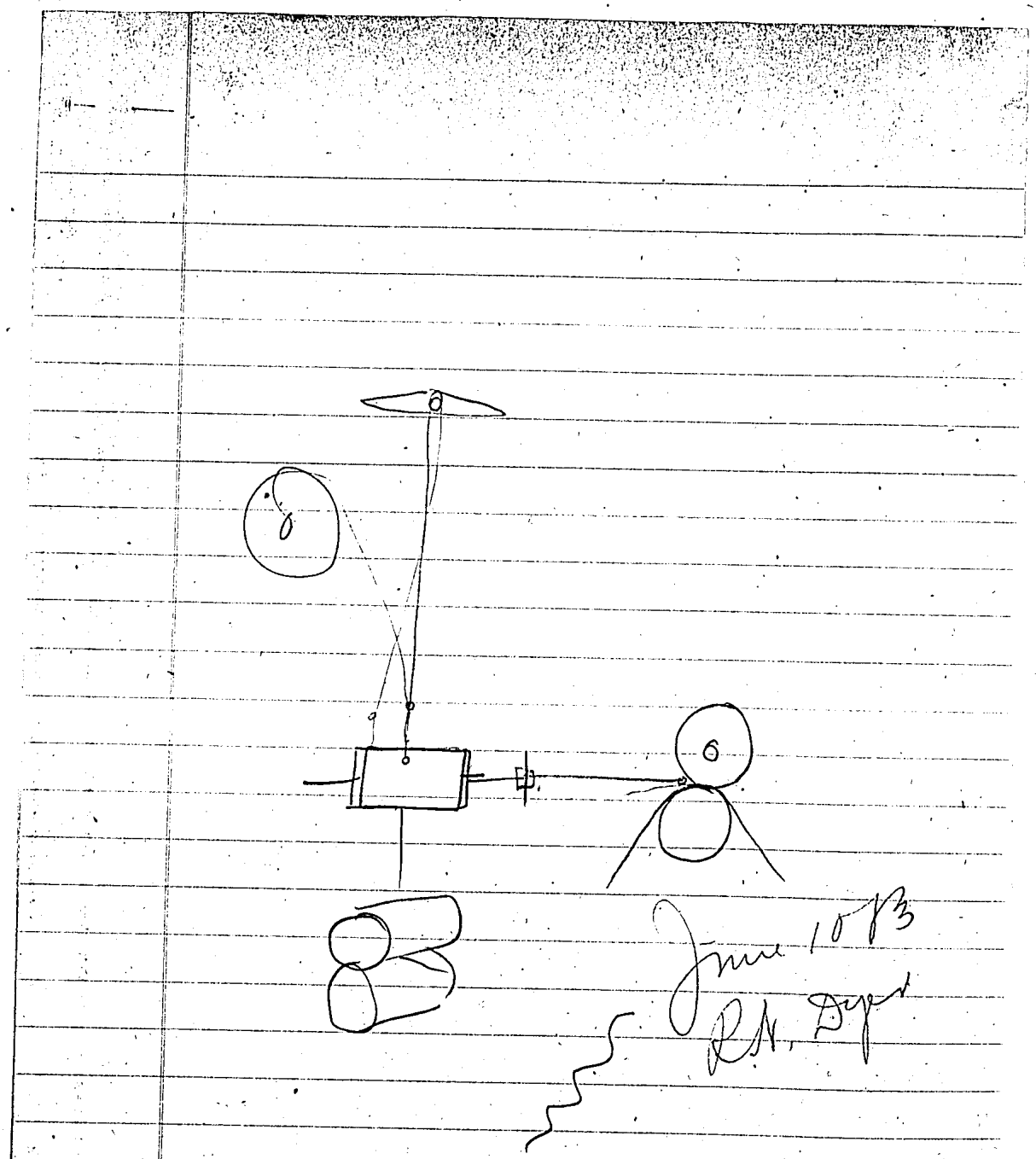



June 10 '83
R.N. Dyps.

Working clock with
motor and
when lamp

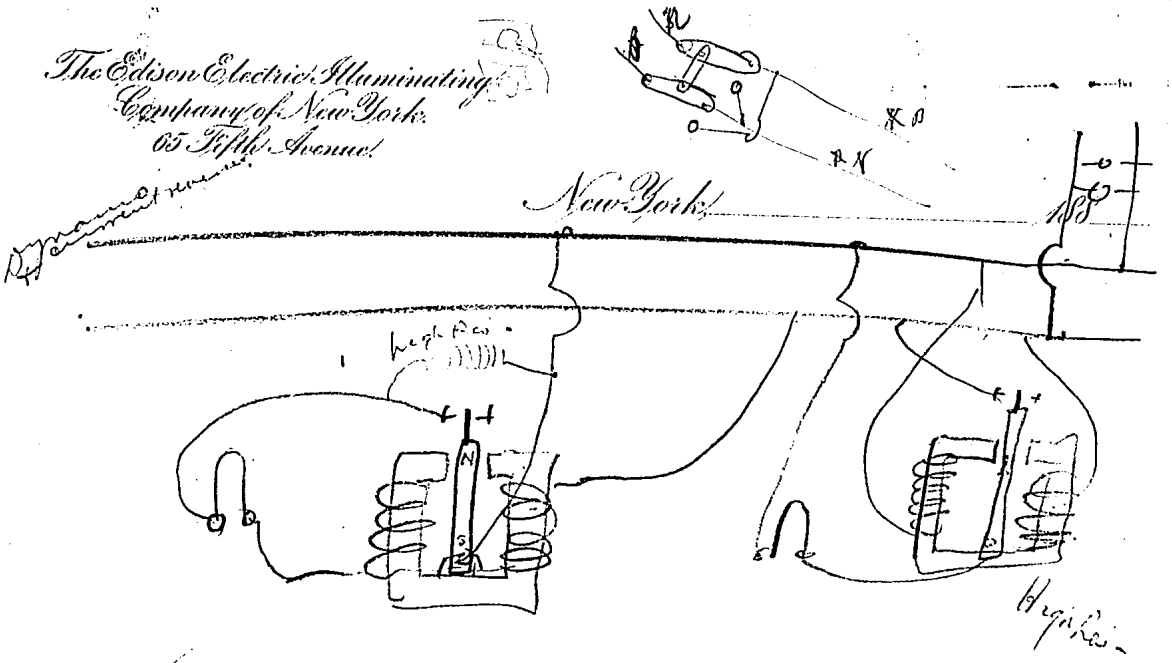

June 1883
E. A. Dyer.




June 10 B3
R.A. Dept

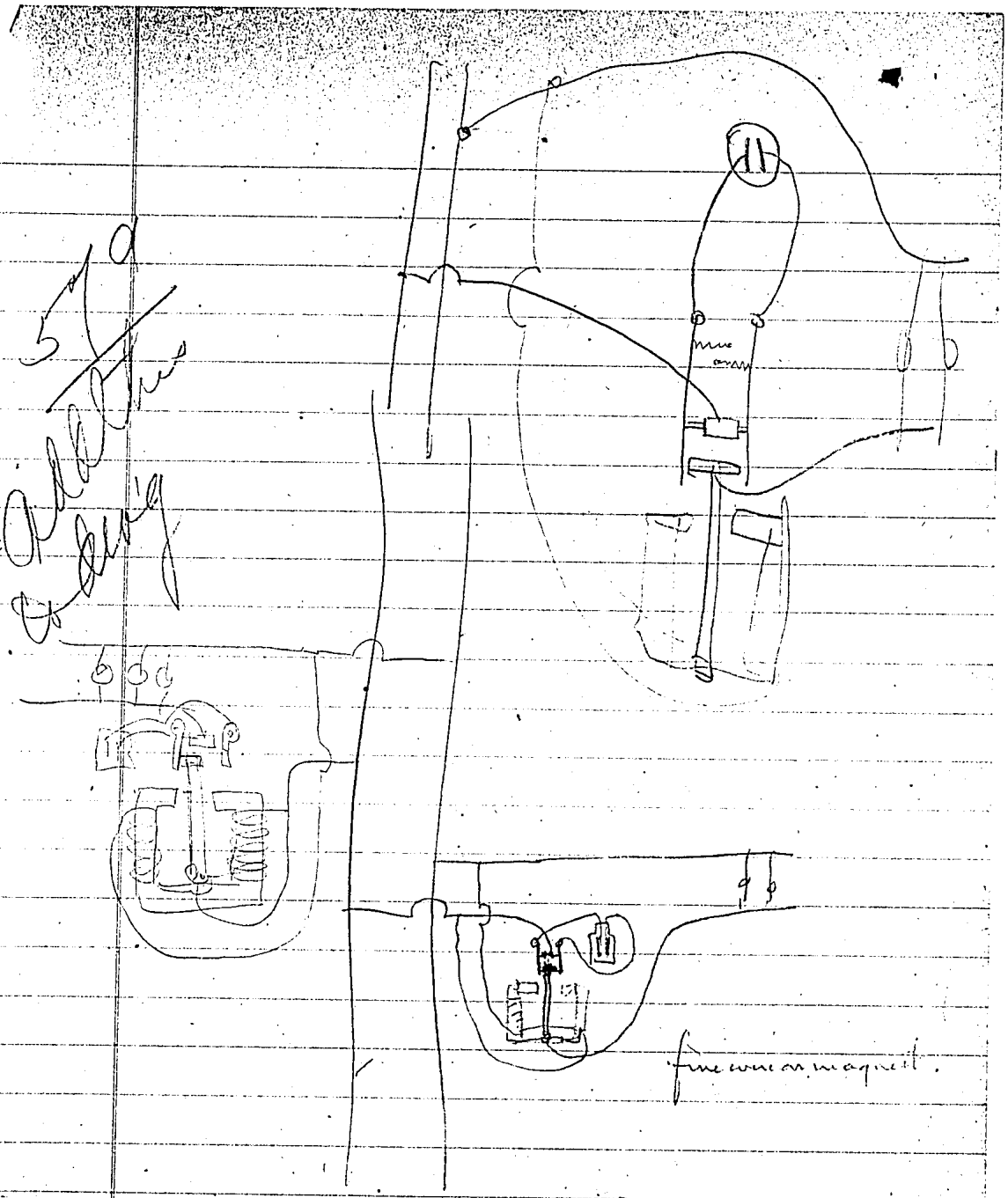
The Edison Electric Illuminating
Company of New York
65 Fifth Avenue

New York

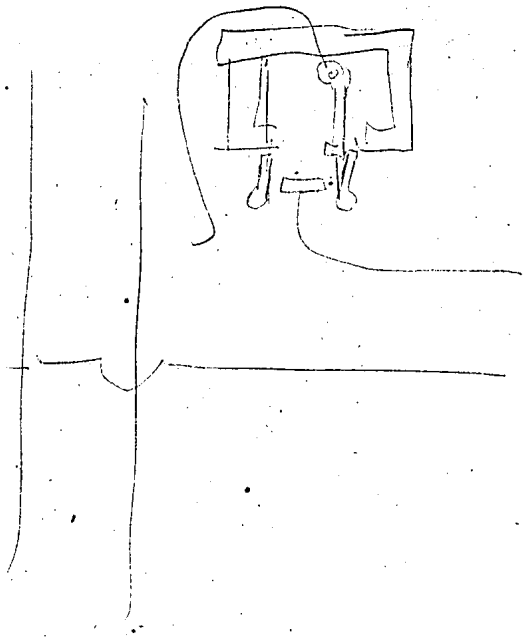



June 11 83
Rec'd Dept

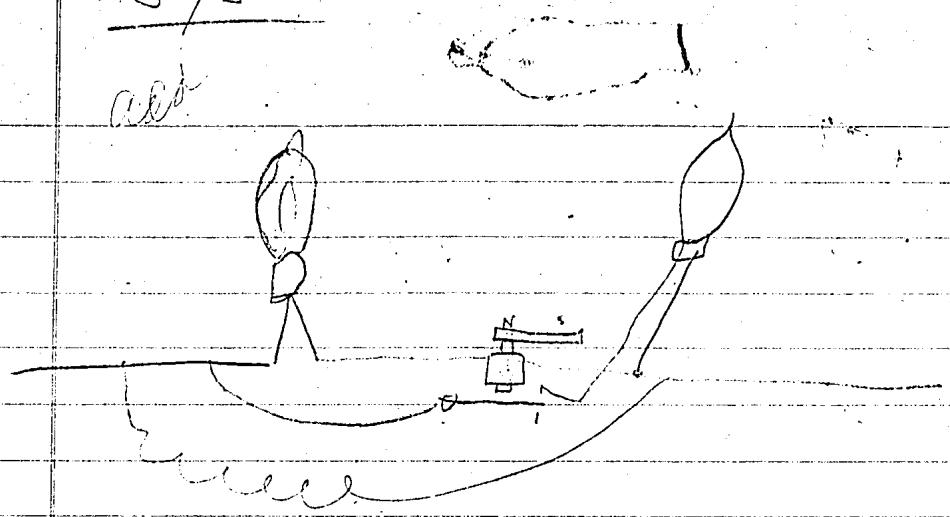
Mention that apparatus might be used for working other things. In claim 1 broadly Galvanograph in combination with electric lighting system wherein lamps are not affected by changes in current.
Electro-Gilding
Meters cannot be used, but there is no need of making mention of this.



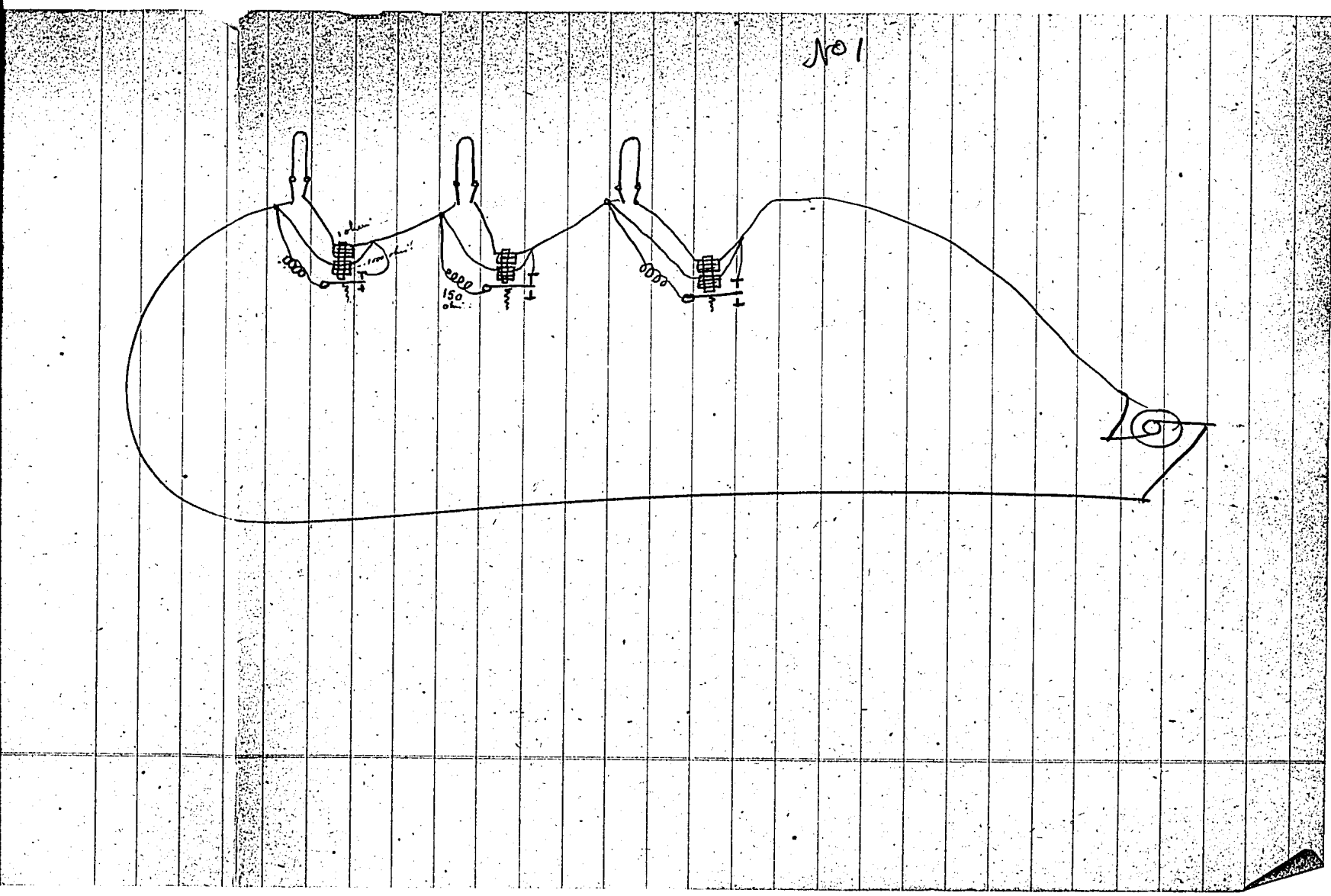

June 12, '83
Thursday



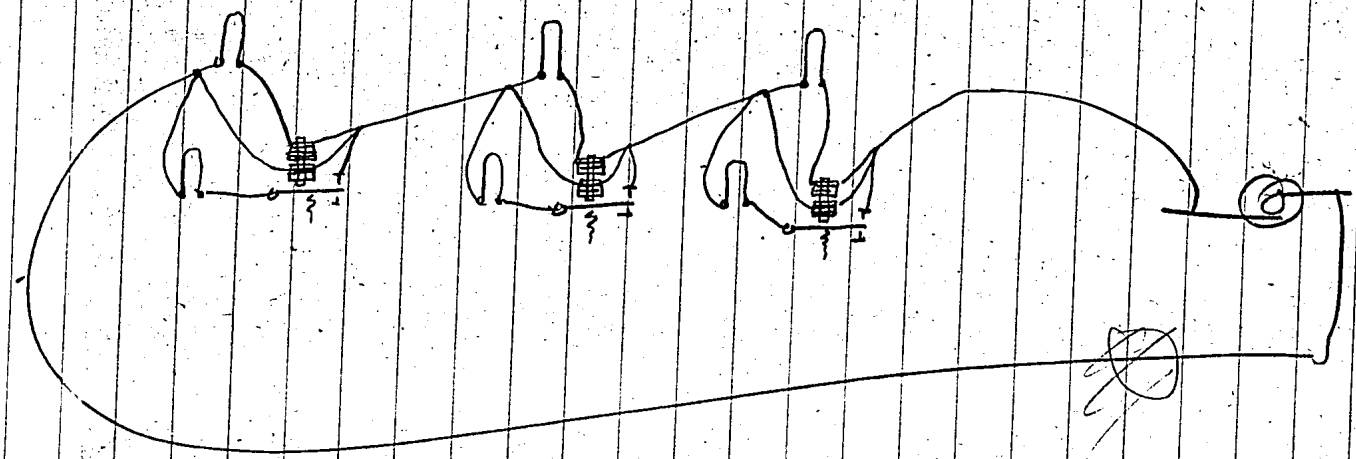
578



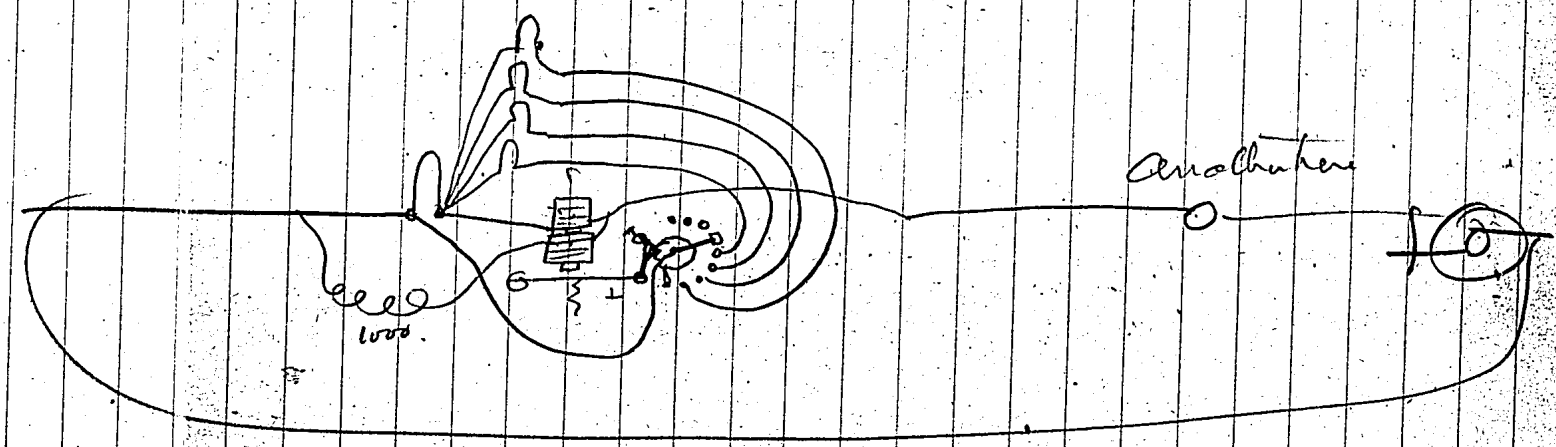
June 25, 85


No 1
150

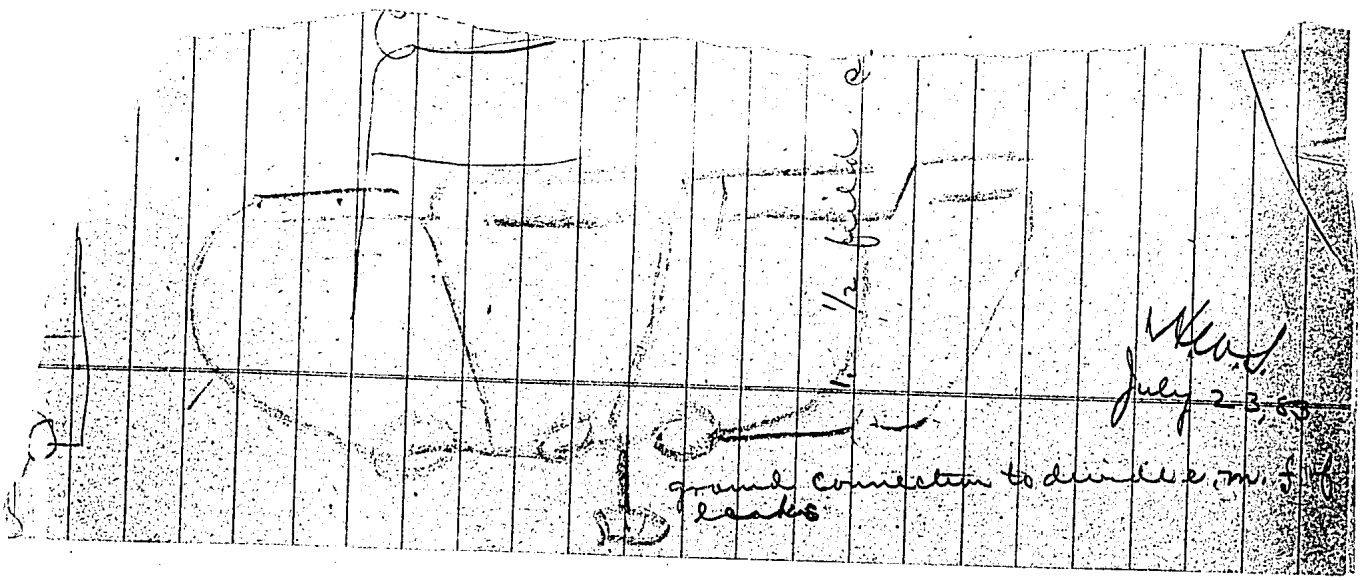
№ 2

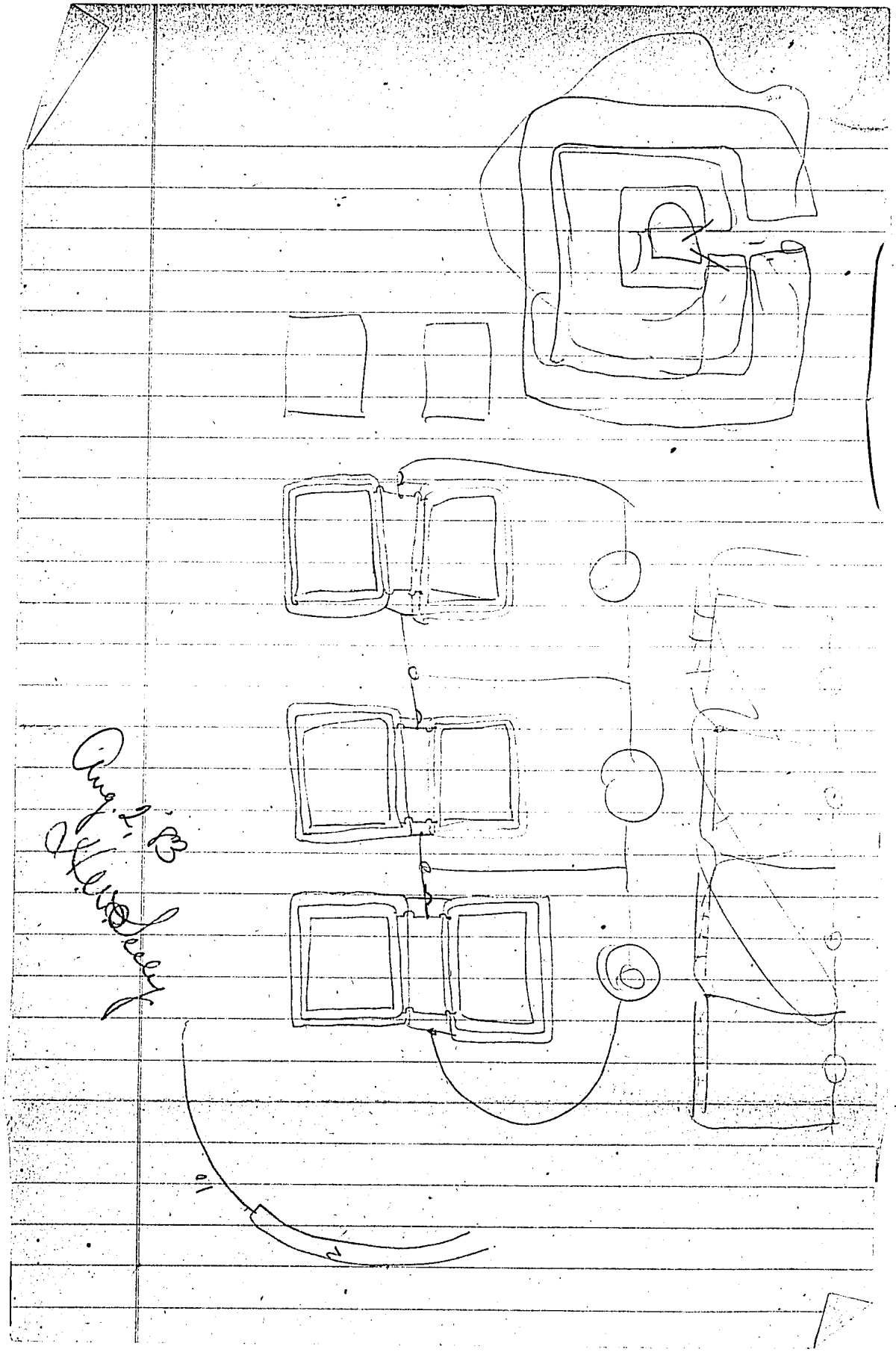


No 3



July

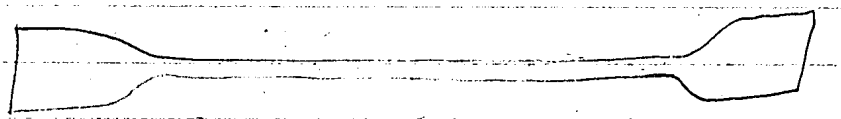

July 2-3-68
ground connection to divide between the two banks

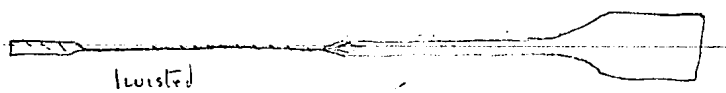


Twisted tight into
thermoplastic paper tissue

Patent

The invention consists of forming a cylindrical
filament for carbonization by
Cutting out a blank from paper or other
organic tissue with broadened Ends & Twisting
the same with a cementing material to form a
Cylindrical filament with thickened Ends






Aug 21, '63 Wheatley

The flat blank of tissue paper is covered with
a carbonizable cement such as gum tragacanth,
& twisted together by winding in a even manner
An alternative is to twist without the cementing
material & afterwards gelatinize the portion of the
Cellulose of the paper by immersion in a solution
of Hydrofluoric acid & cement the whole into a
Homogeneous mass

Claim: The filament for Carbonization made substantially as
herein specified —

Will that form of claim cover better than broad
specific claim? ? — E

Aug 1883

Aug. 21, '83
H. W. Seely

The object of this invention is to prepare blanks from which filaments may be cut or punched for producing flexible filaments of Carbon for incandescing Electric Lamps

The invention consists in employing thin pure & even made tissue paper rubbing soaking several pieces of the same in a thick mucilage of gum tragacanth, ~~Resin~~ or other suitable Carbohydrate, or viscous substance carbonizable without extraneous volatilization then placing 2 or more sheets of paper together & drying the same under strain & pressure to produce a perfectly even blank - ~~the grain~~ paper having a grain one sheet is laid on the other so the grain shall be at right angles, a modification of this invention consists in treating each sheet simultaneously with Hydrofluoric acid & then immediately putting them together as stated, drying under strain & pressure.

Claim: a. Blank for cutting filaments for Carbon from consisting of 2 or more thin sheets of paper united together by a Carbonizable cementing Compound for the purpose

2nd - Drying under strain & pressure.

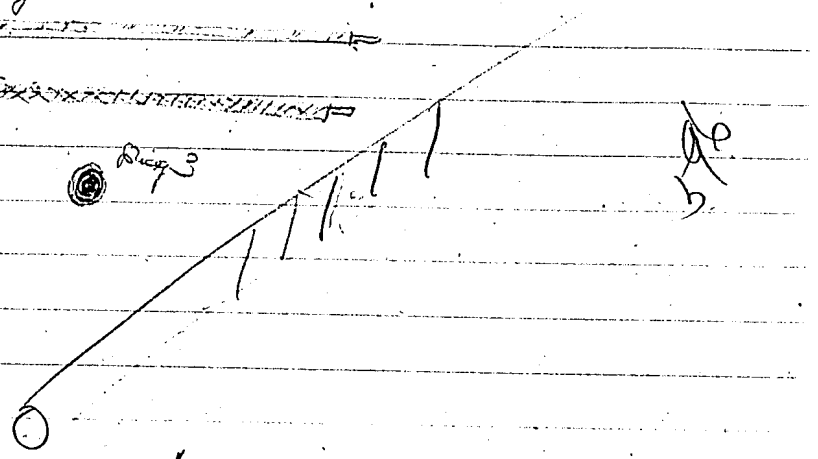
3 across the grain -

producing the cementing by acting on the sheets previous ~~to the use of~~

Dig 1

Dig 2

Dig 3



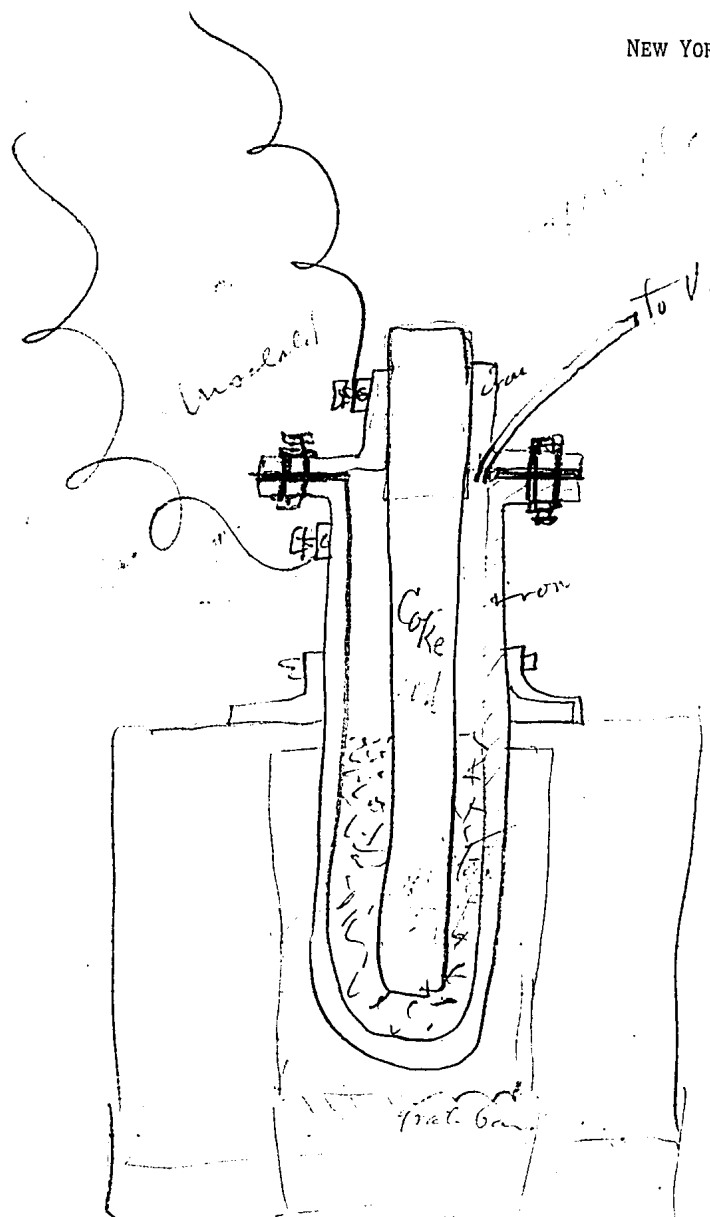
Covering of [illegible]
[illegible] japanned or nat—
Retaining covering of
braided or wound [illegible]
the metallic [illegible]
[illegible] paper [illegible] to [illegible] non
~~conducting~~ insulating ~~to prevent~~
preventing high tension induced current
[illegible] or any part or metallic
of [illegible] including the [illegible]
[illegible]

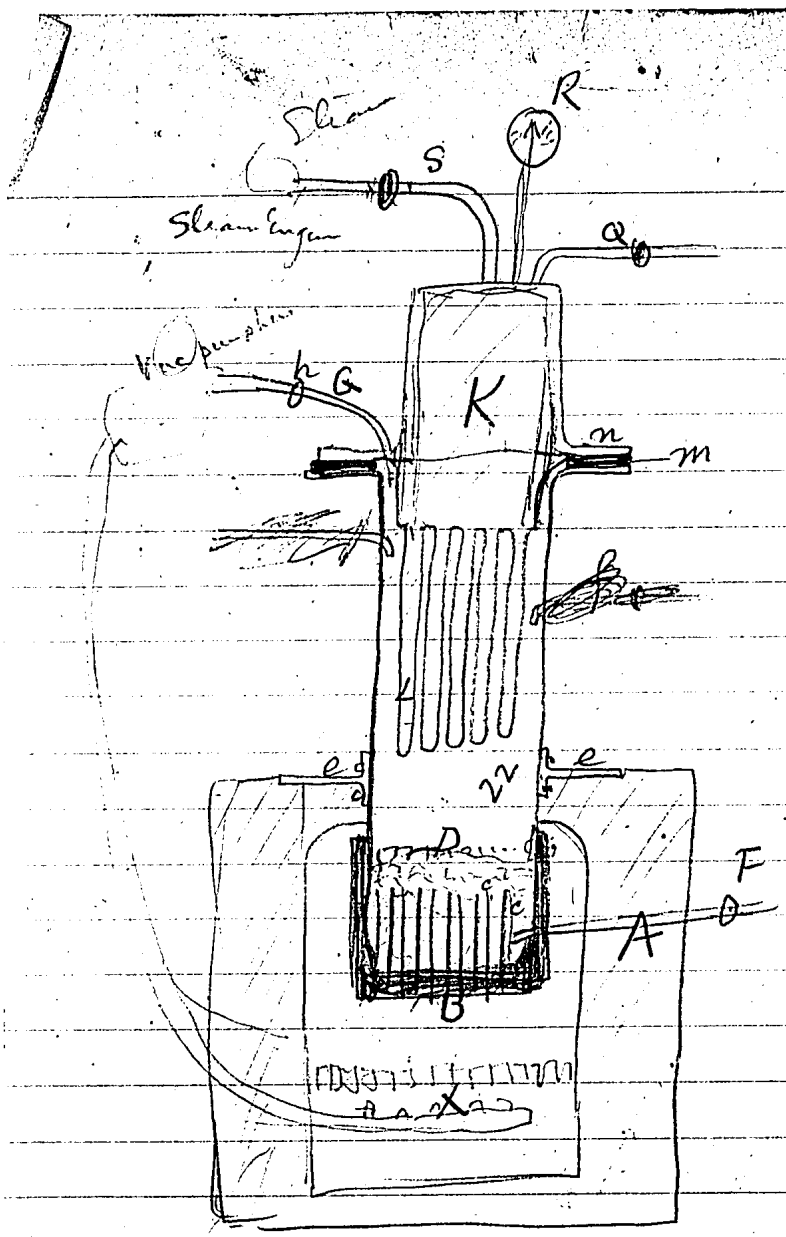
Paper in combination with [illegible]
spirally with overlapping edge.

Aug 31 '88

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, ..... 188






Sept 7th 1883

Antheridia

Rich H. Dyer

Newberry

Sept 7 83
Rec'd Sept
Hurley

The object of this invention is to produce Electricity from the ~~dry~~ oxidation or reduction of a reducing or oxidizable substances such as Carbon Metal or Carbon + an oxide of a metal,

The invention consists in oxidizing the oxidizable substance in an exhausted chamber, formed of two insulated Conductors or Collectors of the two electricities set free by the decomposition + oxidation.

The invention further consists in assisting oxidation + decomposition by the application of ~~heat~~ exterior to the Chambers

The invention further consists in Causing heated electrified gas produced by combustion + decomposition within a closed Chamber to become a good conductor of Electricity by means of keeping the ~~rarefication~~ of the gases of the chamber at a point near a vacuum + thus cause the practical utilization of the Electricity produced by dry combustion by Causing continuous Current of great

Sept 28 1903 Rec'd Monterey .2.

Volume to be set up-

The invention further Consists in absorbing the waste heat of the chamber by water to form steam to give motion to the steam motor which keeps of a Continuous process of Exhaustion of the gases from the chamber to pump water to the chamber to supply that Lost by formation into steam + the utilization of the Hydrogen or Carbonic oxide given off to heat the chamber

The invention further Consists in ejecting Water vapor into the Vacuum Chamber upon the incandescent Combustible substance to produce a decomposition of the water by the reducing action of the incandiscent Metal & thus set free the two Electrents ~~and the~~ or the equivalent of mixing with the Carbon an oxide of a reducable metal its oxigen Combining with the Carbon to form Carbone oxide which passing to the insulated Chamber giving Electricity to it of one polarity while the reduced Metal retains the Electricity of the opposite Chamber remaining to Charge the other Chamber

Jul 17 B
Pat Applied for
Mr Stanley



A is a furnace
x grate bars
22 a flanged Borda tube with a thick Cast iron head B. on the inner surface of which are iron rods projecting upwards & between which the Carbon D is packed

K is the other chamber with water tube L projecting down into the Chamber 22 The 2 chambers are insulated from each other at the flanges N by asbestos packing & cement at M. This forms a closed chamber containing the Oxidizable powdered Metal K is filled with water by the pipe Q which is connected to a feed pump R is a steam gauge

G is a metallic pipe passing through K but not touching it & thence into the chamber 22 This pipe is connected to a vacuum pump worked continuously by Steam

F is a pipe for allowing water vapor or steam to pass into the chamber & Come in Contact with the manganese Metallic The Carbon being brought to incandescence by the furnace.

Several of these chambers may be connected in series the part 22 being connected to the chamber K of the next chamber or they may be connected in multiple arc.

When water is not used Oxide of Lead may be mixed with the carbon in the Coke and the Coke or Lampblack or charcoal may be used as all these forms of carbon including anthracite Coal become Excellent Conductors when incandescent although the latter is not a conductor when Cold. When an oxidizable metal is used for

Claim - Improvement in the art of obtaining Electricity such as described

The Method, & all the broadest claims that a new & novel method will print yet make.

E

Electrical Pressure Indicator

Dyer =

I have just completed a pressure indicator which works perfectly X X' are the coils Copper wire L is heavy steel needle magnetized it is mounted on a torsion wire T which has its torsion increased or diminished by turning the smooth stud M round this is held by friction the Cross piece Brass split & 2 screws 3 & 4 used = K is a spring which keeps the wire T stiff P is a nut for increasing or diminishing the spring — Q is an index straw. The torsion of the wire keeps needle at Zero —



LM is a regular lamp in addition there is a strip of of platina R which is secured to a wire & passes through glass, one End is connected to the galvanometer the other End of the galvanometer is connected to the pole of the lamps upon which the blue halo appears: when the lamp is brought up to incandescence a ~~constant~~ constant current of considerable power passes through the galvanometer wire & deflects the index - The scale may be graduated to read Volts or candle power - A Resistance M. may be put in with the Lamp & adjusted so as

to standardize the lamps to Raise & Lower in Candle power like these on the Current - It is very sensitive ~~up to~~ with regular lamps it differs very little until you reach 12 candles ~~after that each~~ after that it is more nearly proportional to the Candle power - In fig 2 I show 2 Lamps one runs all the time while the other is used to be thrown in circuit to see that the regulator mechanism has not varied -

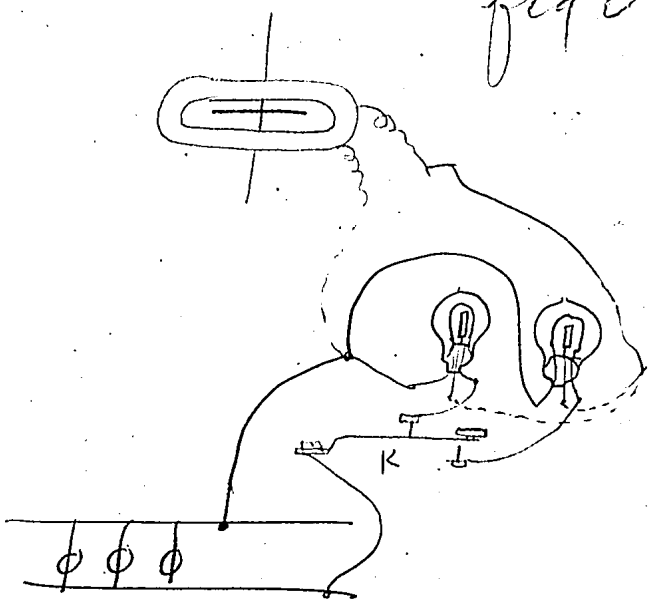
Want broad claims on using the Current given out by ~~the~~ Vacuum Lamps - for this purpose & other purposes This is absolutely new & novel -

E

Oct. 13, '83.

Wit.
Oct. 13, '03
M.W. Sweeney

fig 2




Wit.
Oct. 13, '03
M.W. Sweeney

fig. 3.

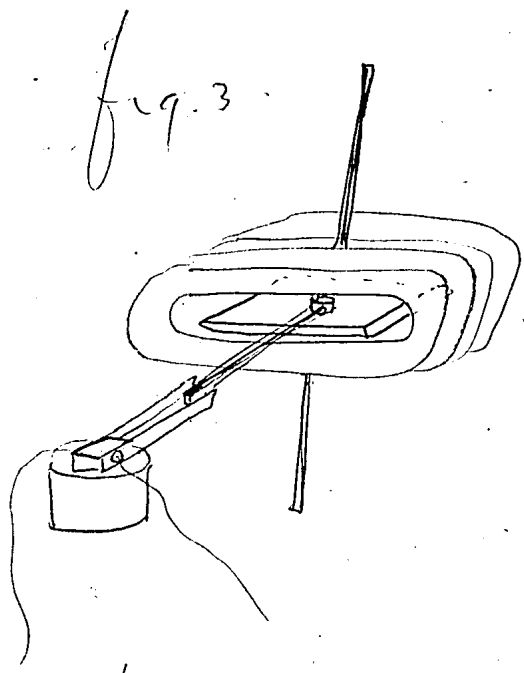
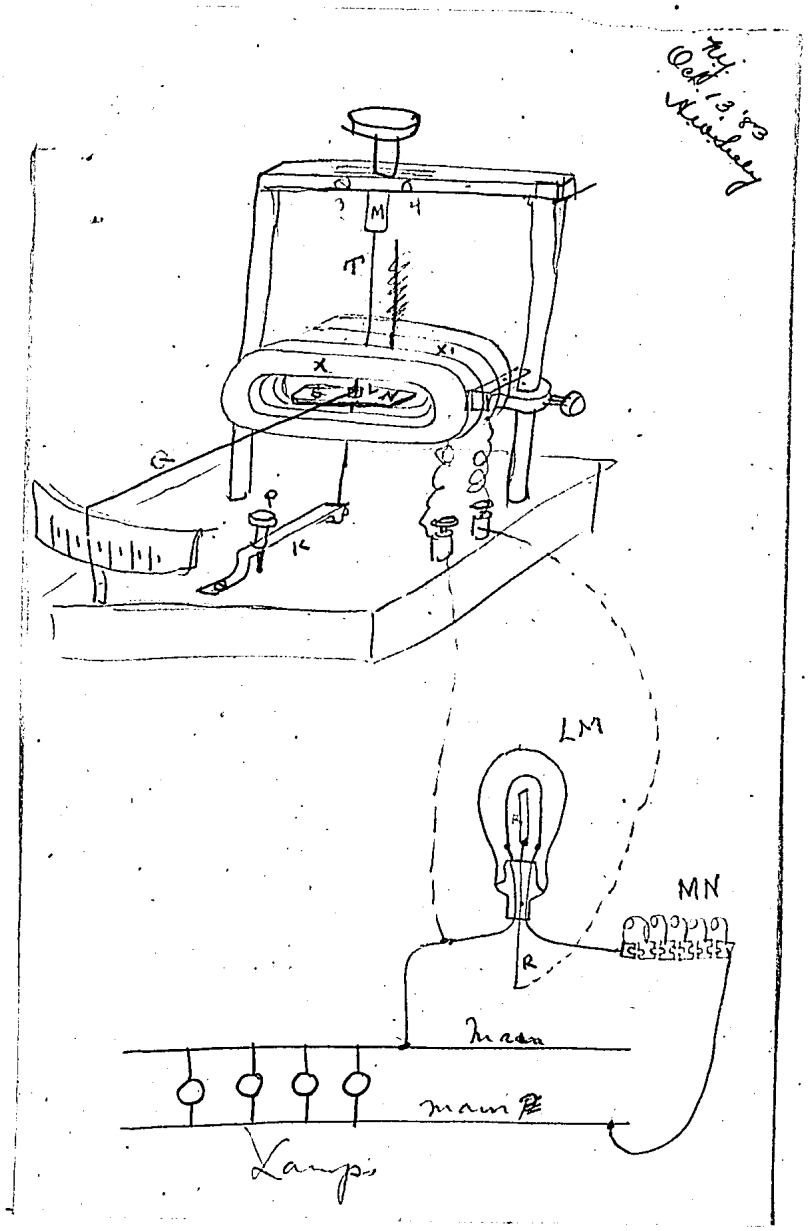


fig shows how it can be arranged to close the circuit for working auto Regulator & perform other things

# —October — 1883.—



# BERGMANN & CO.

# ELECTRICAL WORKS,

SOLE MANUFACTURERS OF

FIXTURES AND APPLIANCES

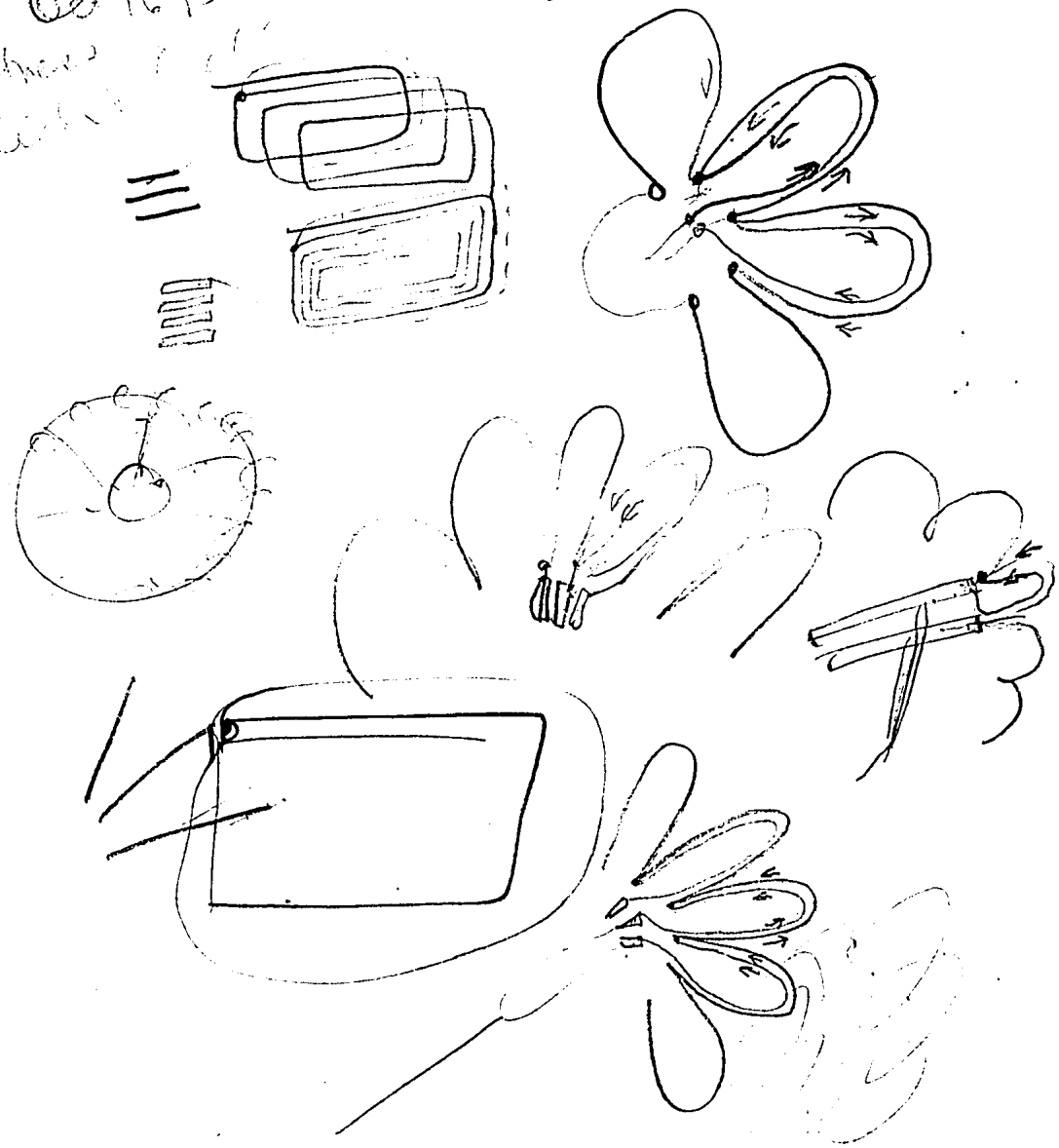
FOR THE

EDISON ELECTRIC LIGHT.

Nos. 292 TO 298 AVENUE B.

*New York,* ..... *188*

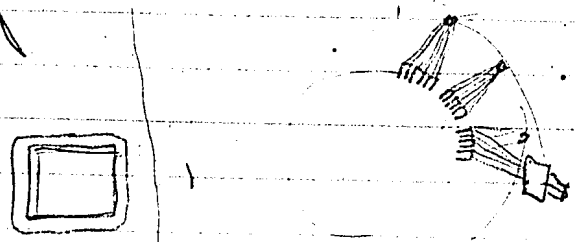
Oct 16 13



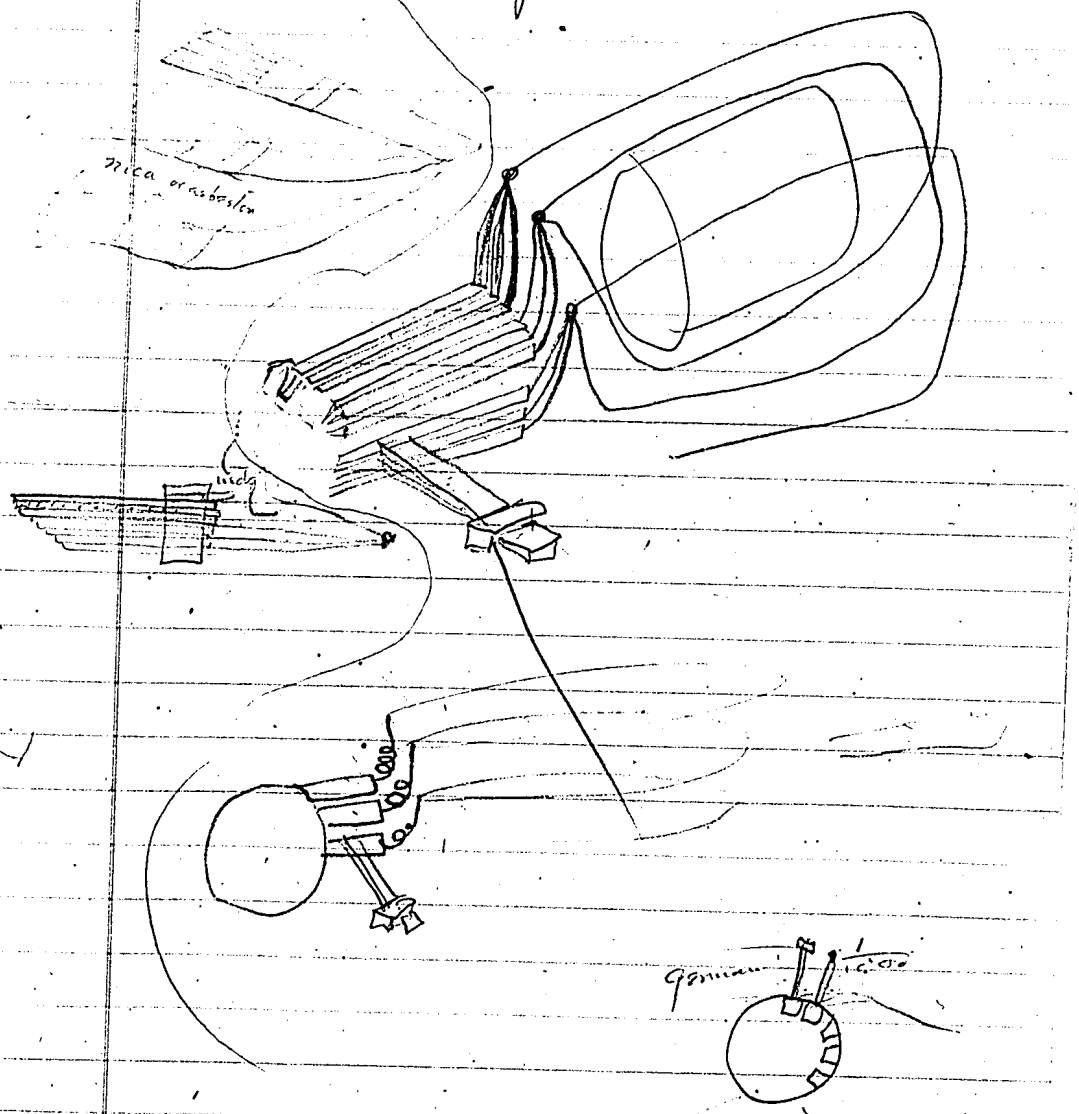
# —November 1883—

276, 233
Apr 24, '83

Nov. 9, '83
Thursday



Arbor under in patent



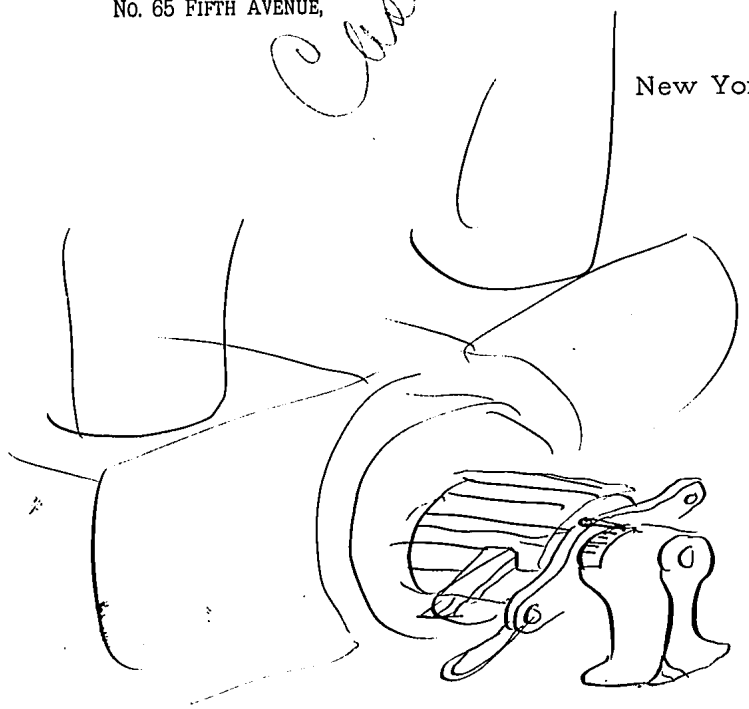
Form L.

THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,

Chas. Hill

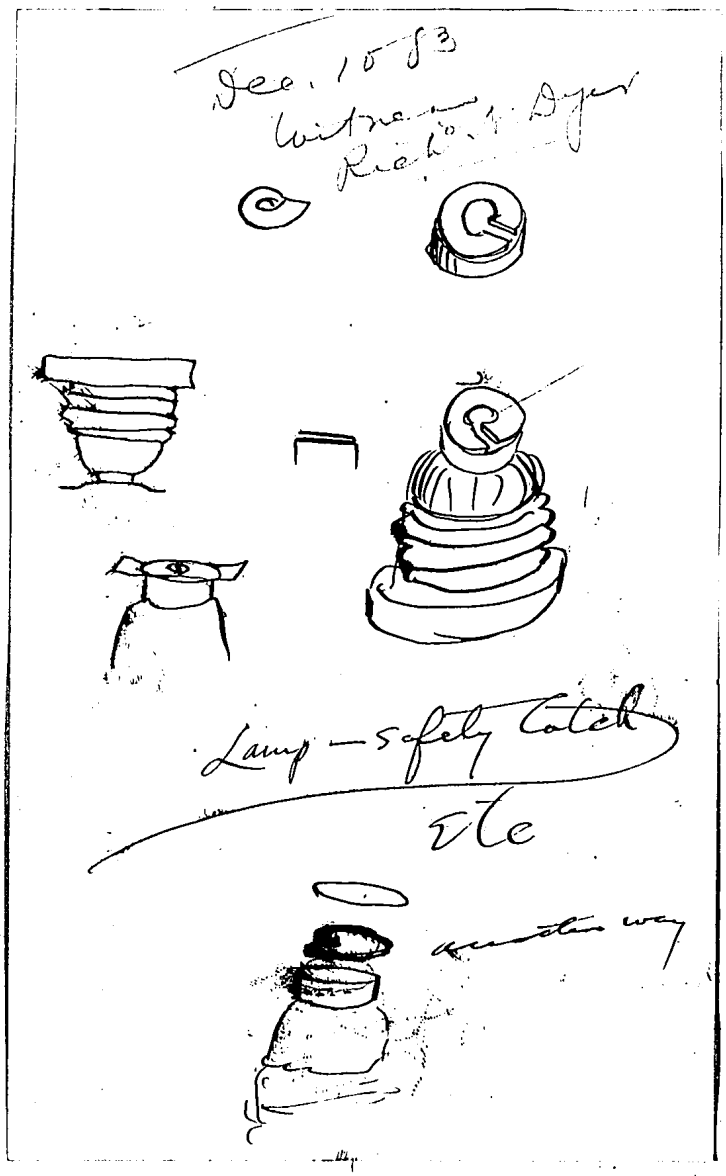
New York, Dec. 18, 1883

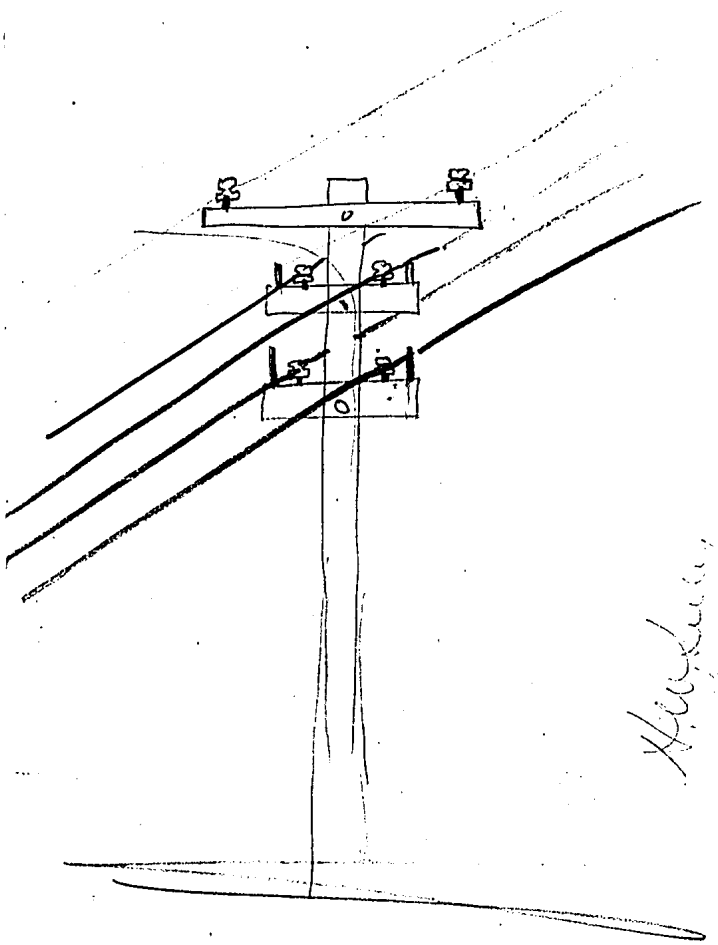
J. W. Dally.

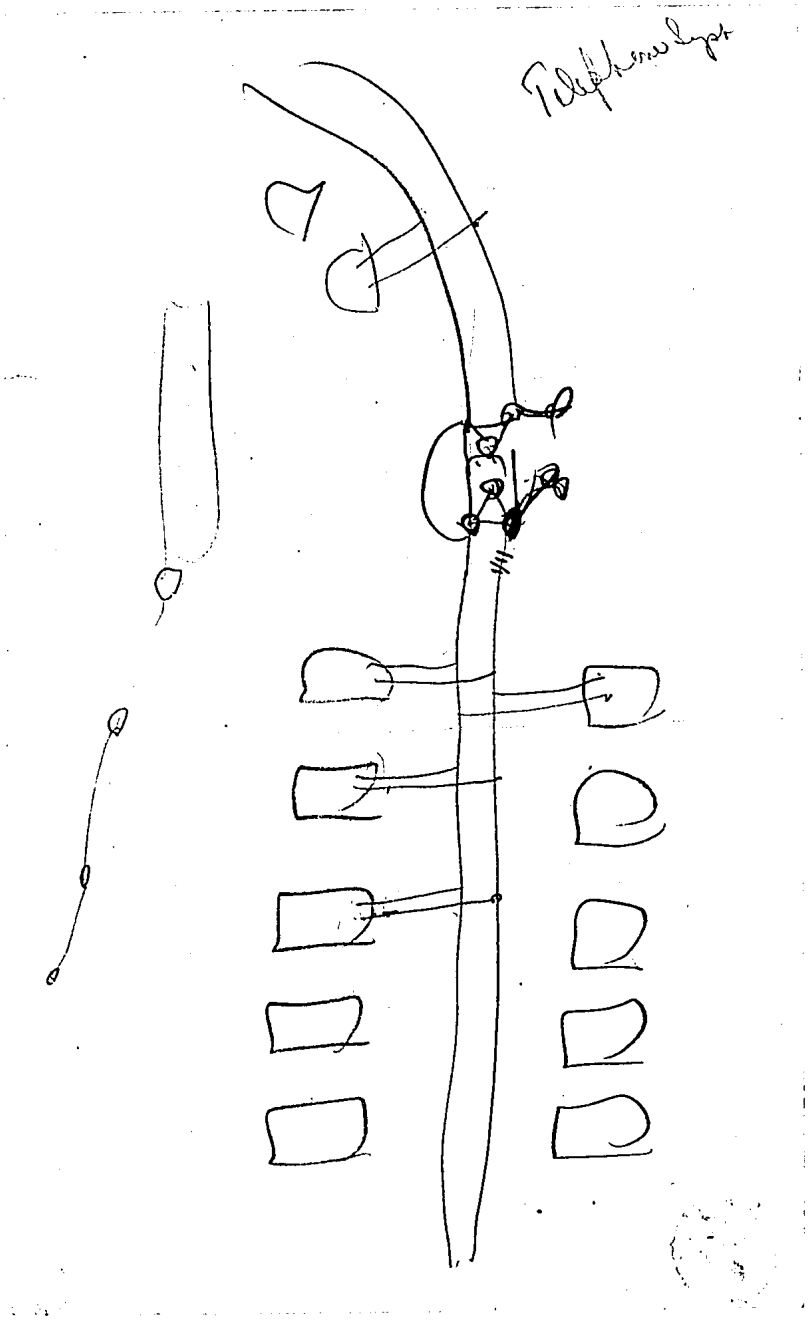


Patent

Leads in armatures. The sparking
[illegible] the brushes depends
[illegible] on no. of armatures. By using
[illegible] brushes are adjusted you know the
load in machine.
Especially when 2 machines of diff. capacity work
R. & Ernst here & some they wanted [illegible] C,
and consequently are burn out.


Dec. 10 83
Lamp — safety Catch
etc





Stat. electromotive n.g.

Volts drop

Increase above
certain candle
power. More
current due
to decrease
rest.

5 volts on 16
candle 100 candle
lamp.

Decrease nearly
proper to candle
power.

## Technical Scrapbook, Cat. 1150

This scrapbook covers the period January-December 1884. The entries are by Edison and relate primarily to electric lighting. Included are notes and drawings concerning lamps, generators, meters, regulators, electric power distribution, and other parts of the system. There is also some material pertaining to ore separators, chemical stock printers, and telephones. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney. The name of Edward C. Rowland, Edison's patent draftsman, appears as a witness on many of the documents. The case number of Edison's patent application has been written on some of the items.

Form 1 B.

ALL COMMUNICATIONS TO BE ADDRESSED TO THE OFFICE.

# EDISON MACHINE WORKS.

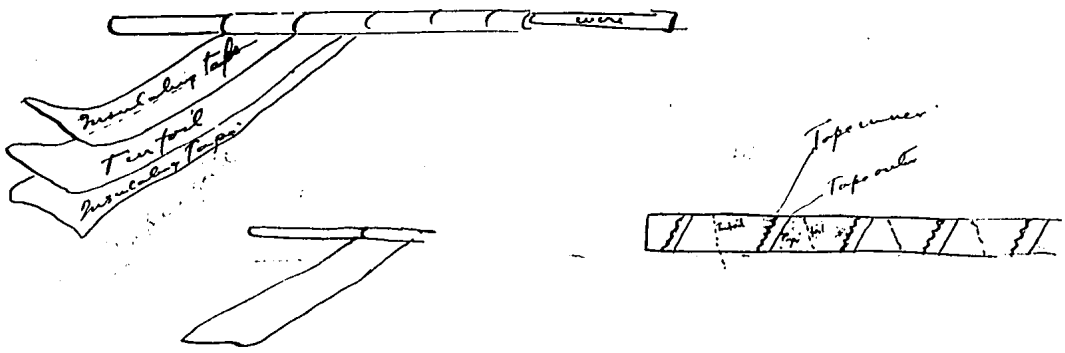
OFFICE, 65 FIFTH AVENUE.

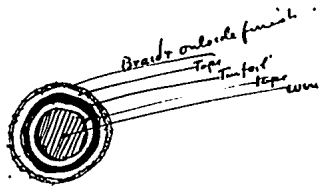
WORKS, 104 GOERCK ST.

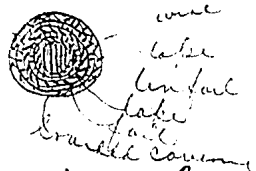
New York, ~~188~~ Jany 84

Dyer -

Take out following patent




I first wind 1 insulating tape strip on the wire overlapping it. Then this is smoothed down and tin foil or lead or ~~any metallic~~ other metallic foil ~~or~~ is wound as a strip overlapping, the center of the strip being over the lap of the tape: over this again is lapped another tape, the center of which is over the lap of the foil. the whole is then preferably braided with cotton but before the braid is put on another layer of foil may be put on & the braid placed over this which

has a tendency to make it fire proof
Especially if the fail is copper fail.

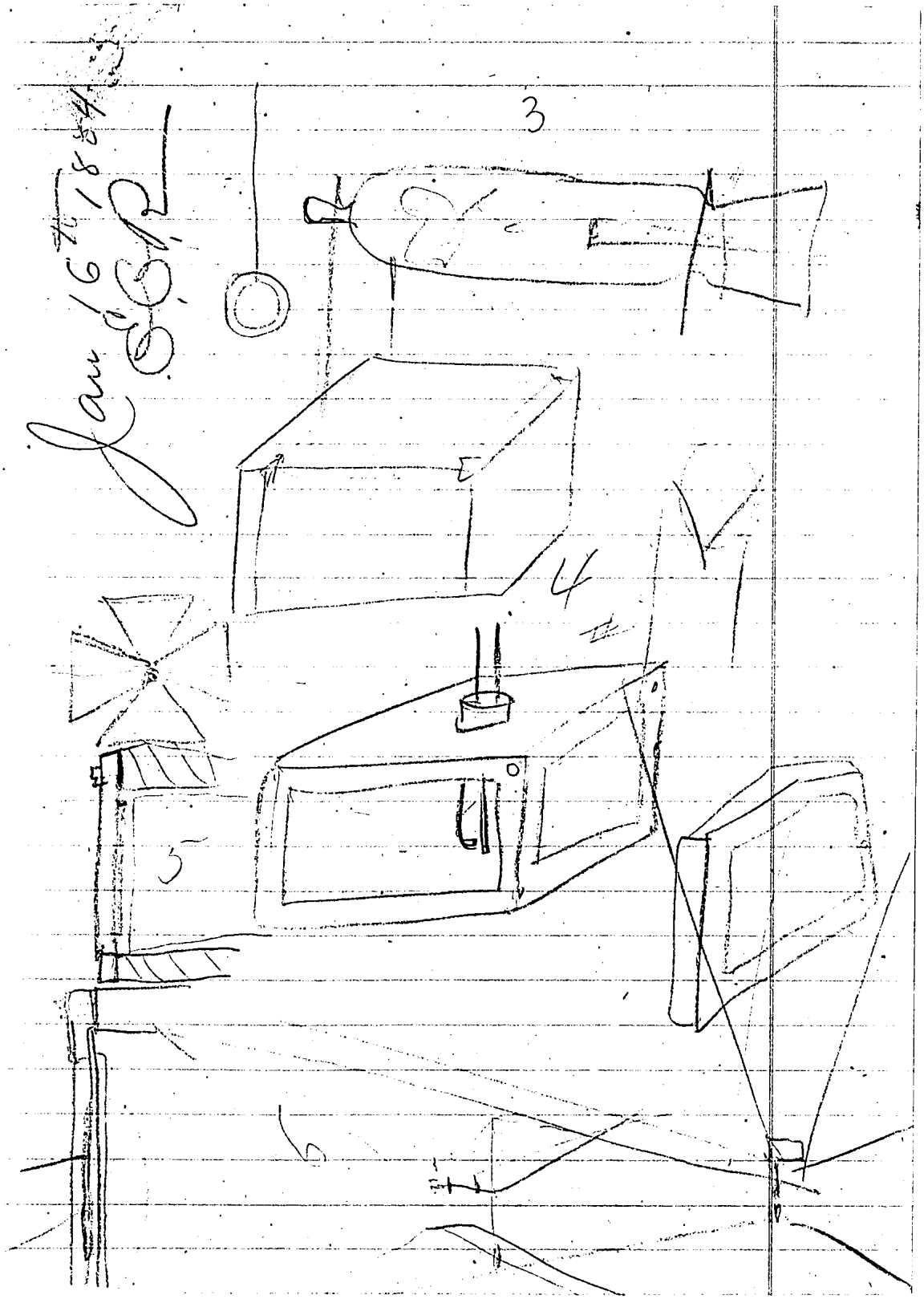
Claim Insulating wire by first coating
the wire with an insulating tape overlapping
then a layer of overlapping metallic
foil then tape + braid

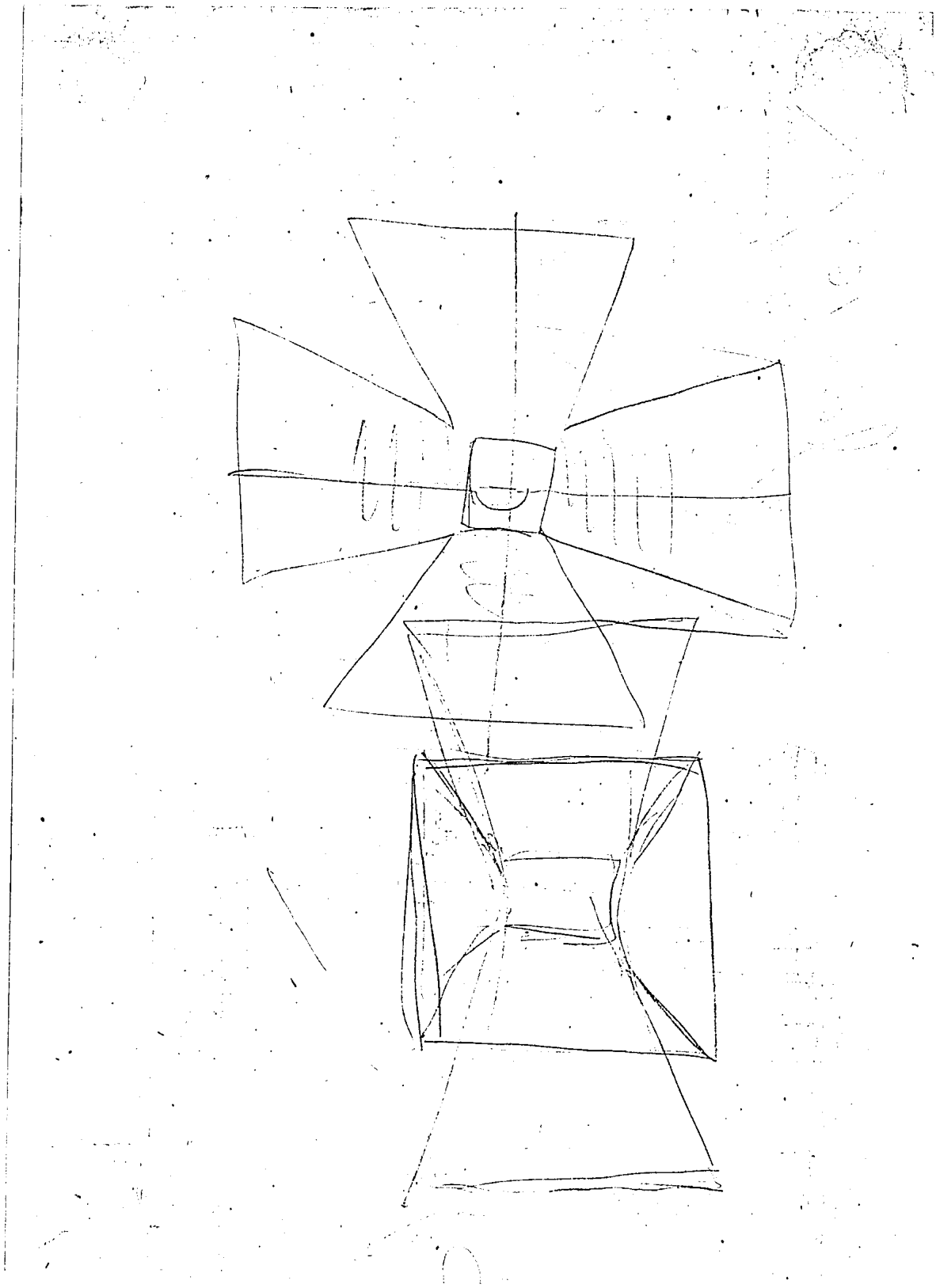
also with double metallic fail + braid

also; with inner tin or lead fail +
outer of copper or other high melting
point foil.

Or claim that the tape is strips
of paper or woven fabric saturated
+ coated with an insulating
Compound.

Kruzi says the insulation of this
wire is astonishing E


Jan 16th 1884
3
4
5
6

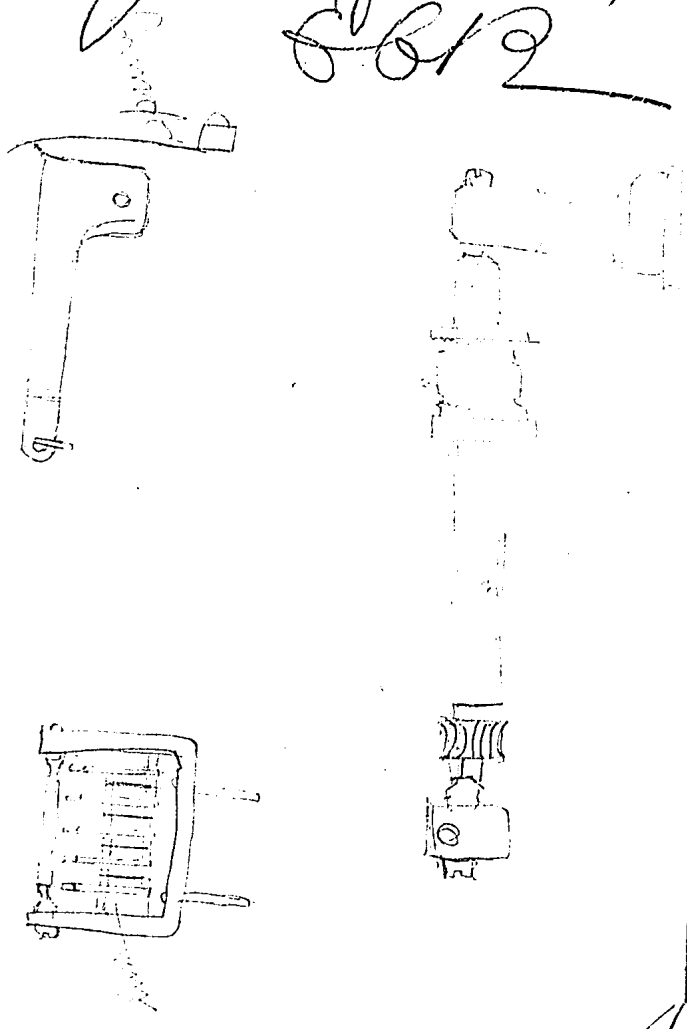


Jan 22nd 1884
E.B.R.

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

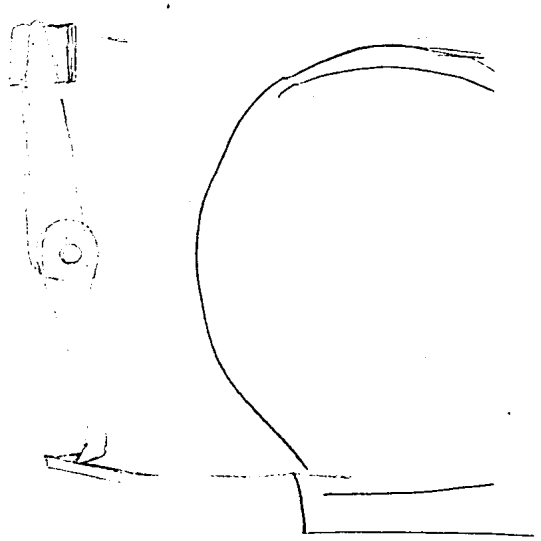
*New York,* ..... *188*

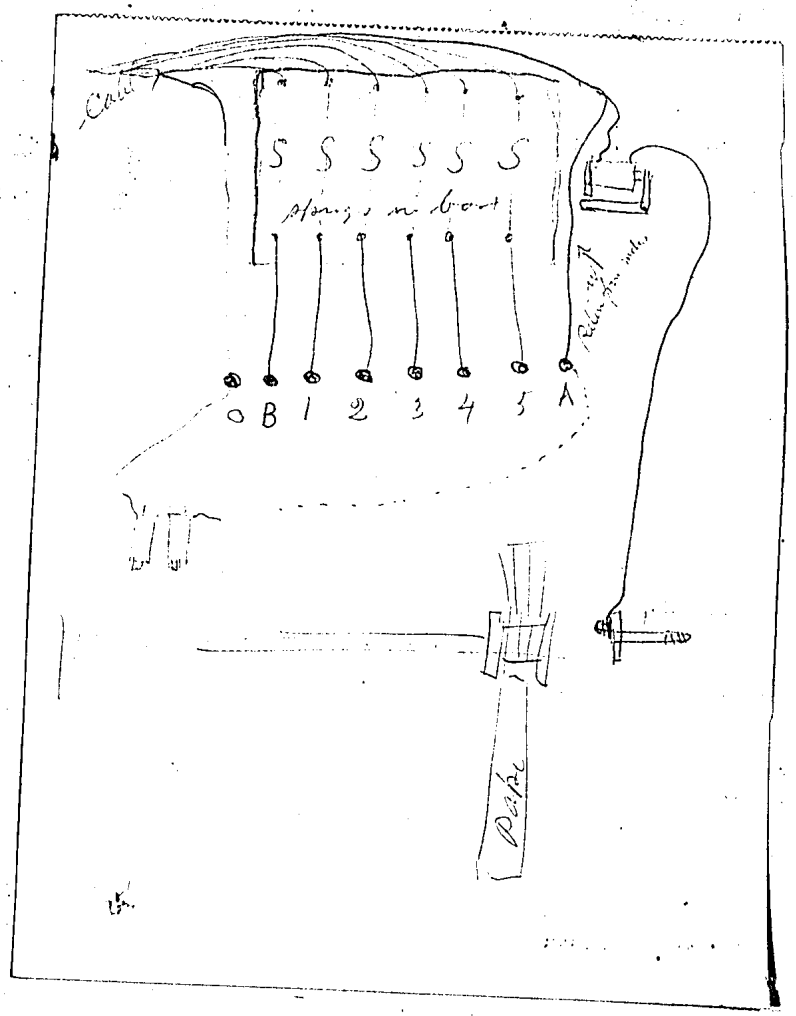
Jan 22nd 1884
E.B.R.



THE [illegible] ELECTRIC LIGHT CO.,
[illegible] AVENUE.

*New York,* ..... 188

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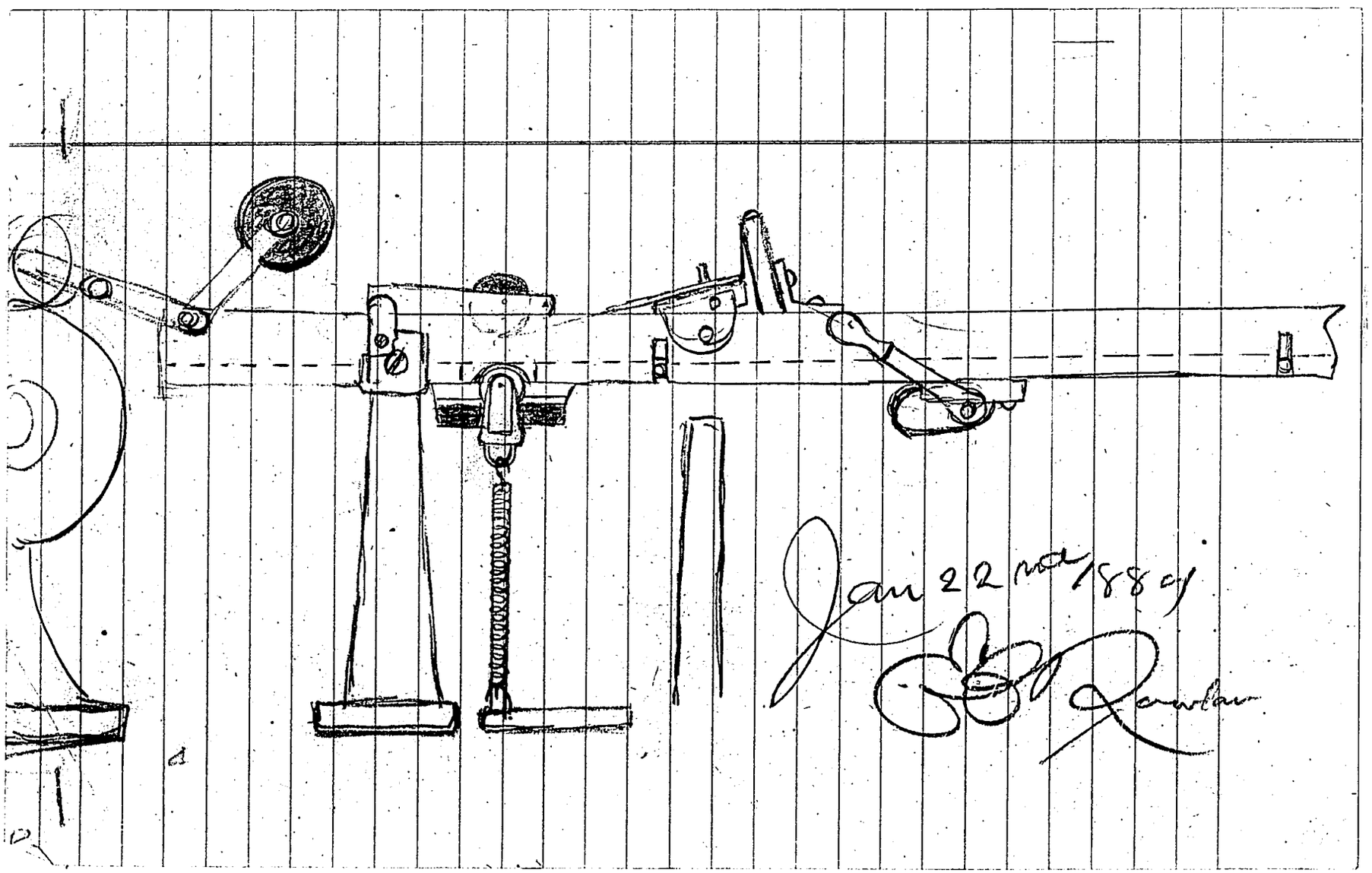
0 B 1 2 3 4 5 A
Pipe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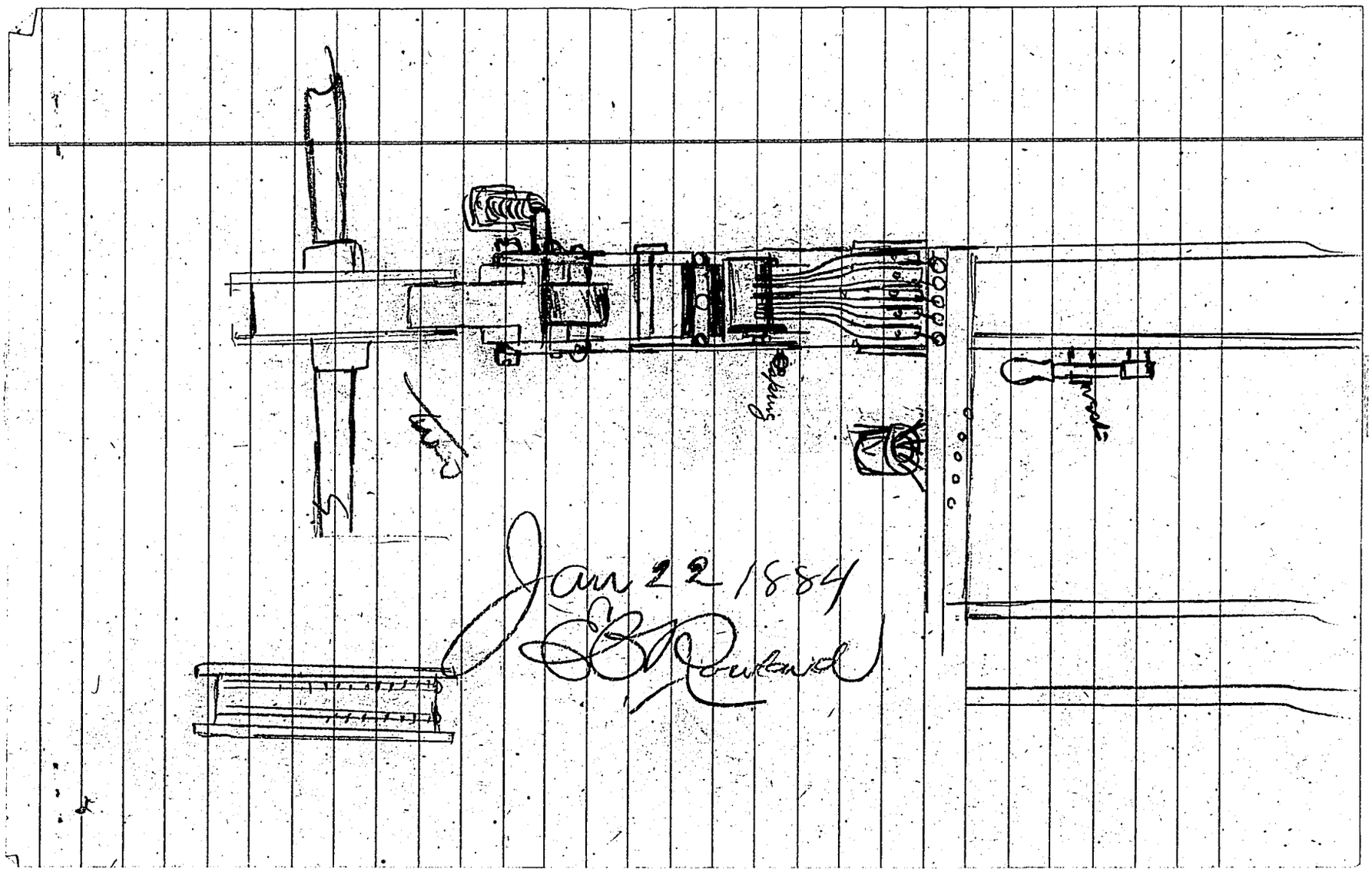
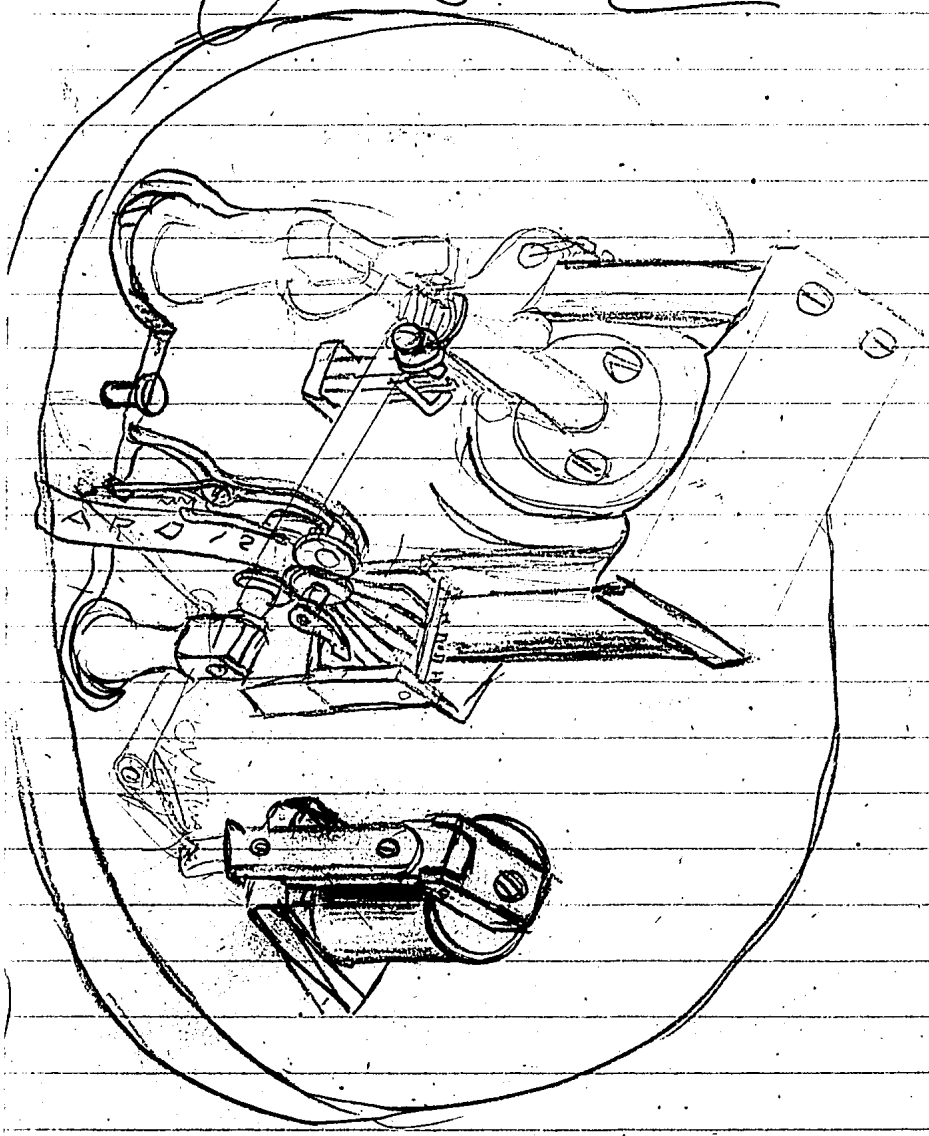

Jan 22 1884

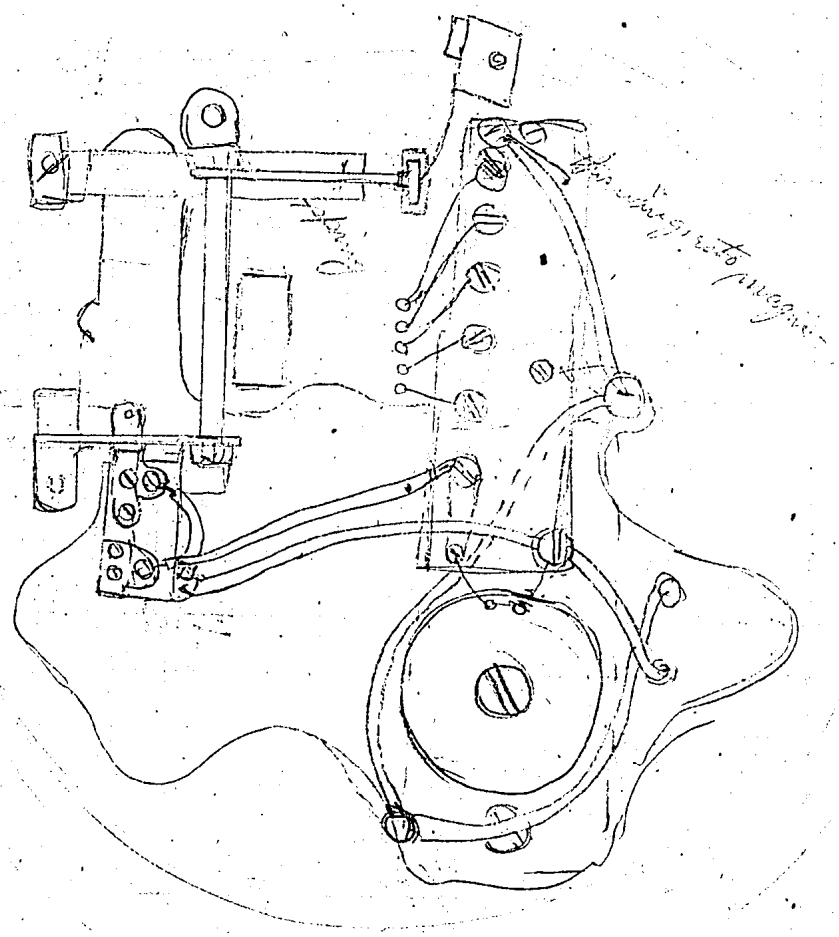
Jan 22 1884

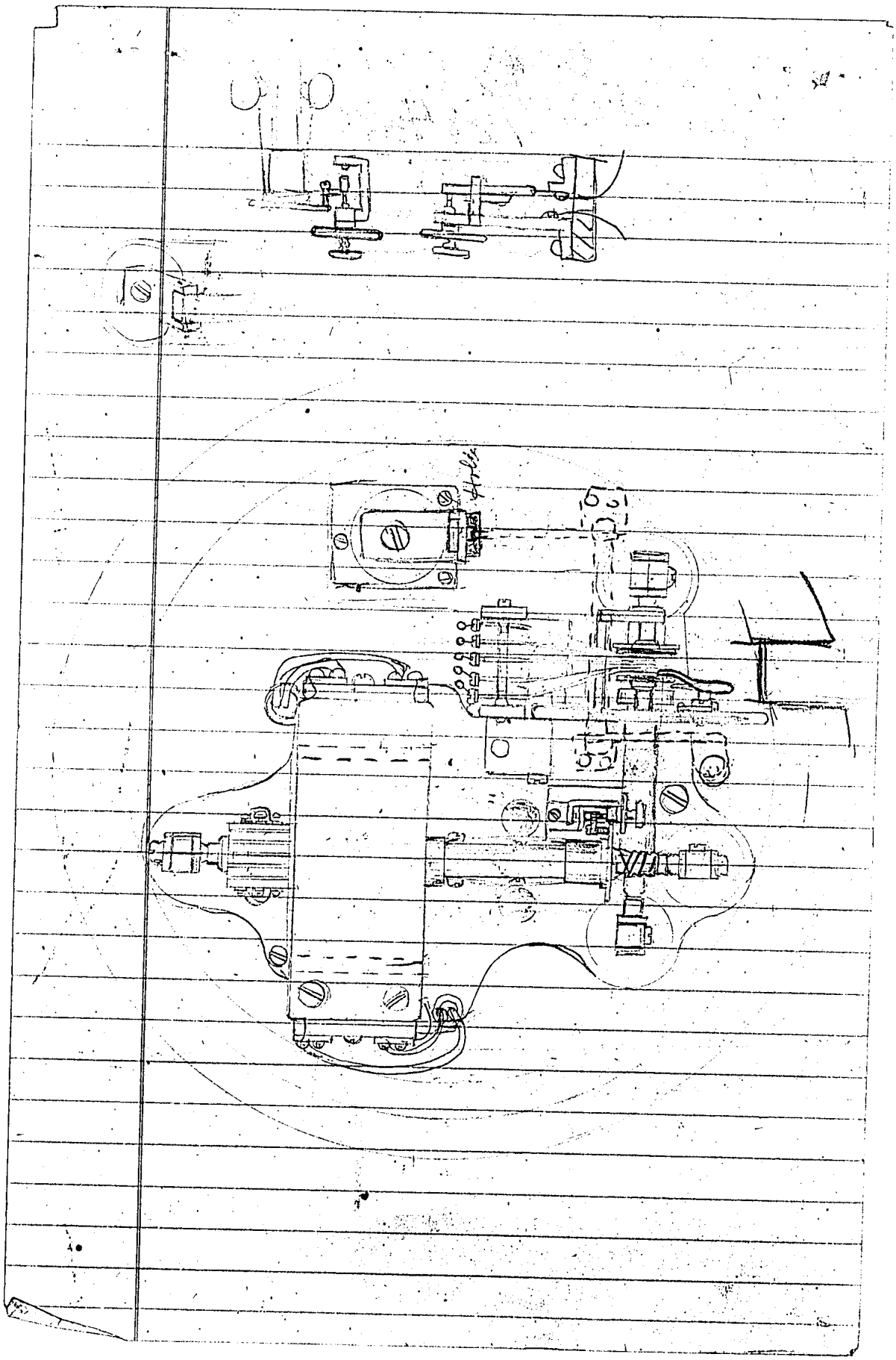


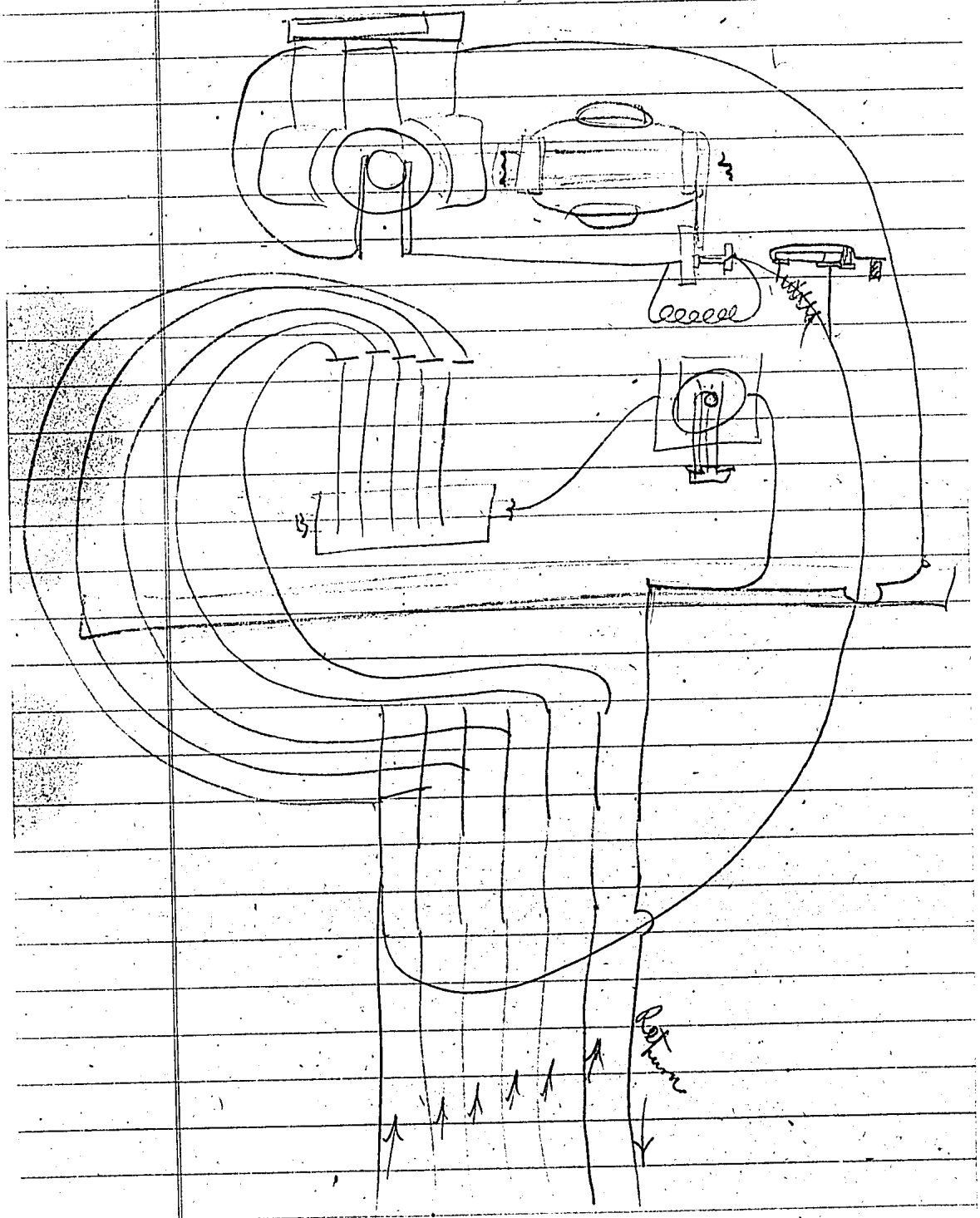
Jan 22nd 1884

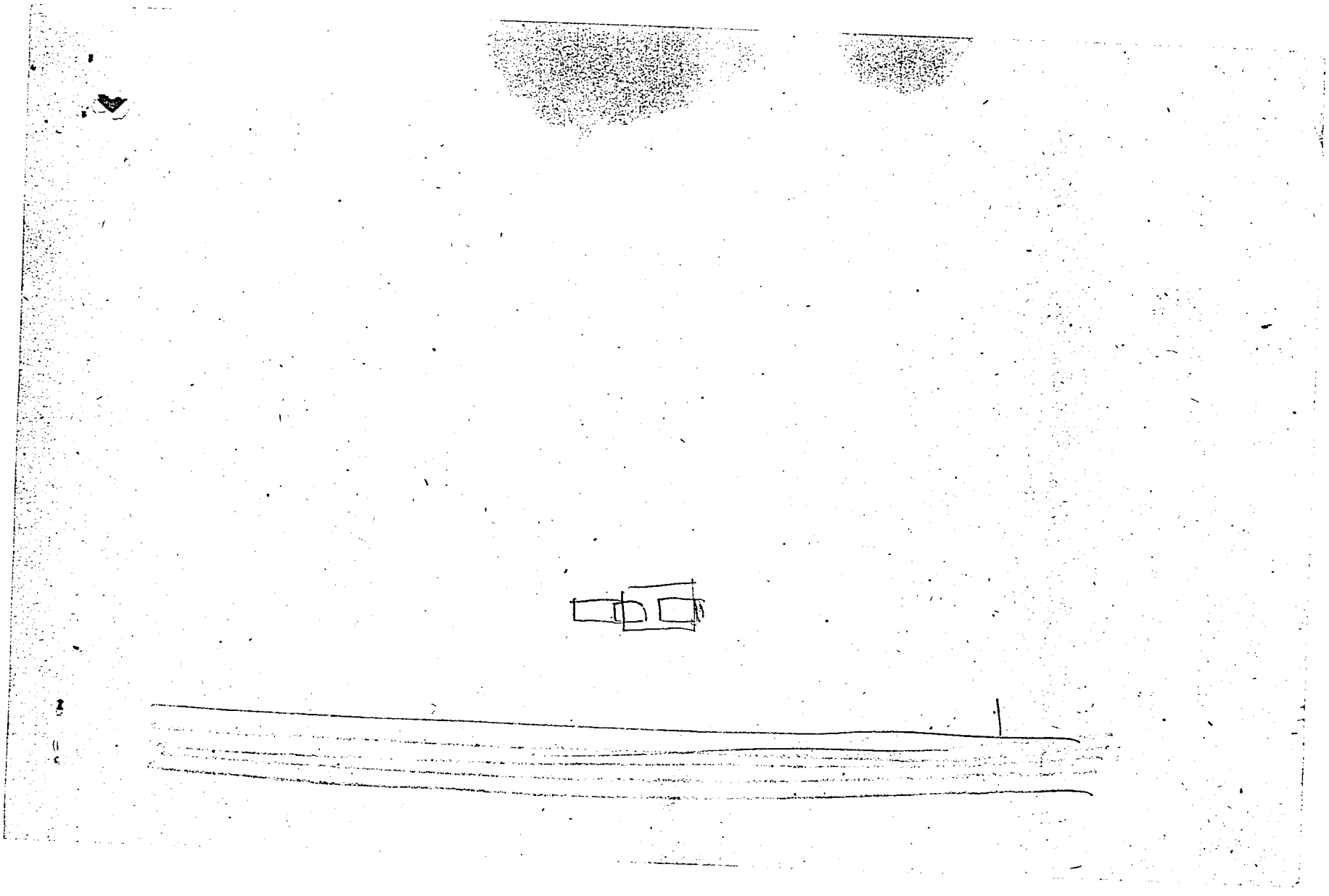
E.B.R

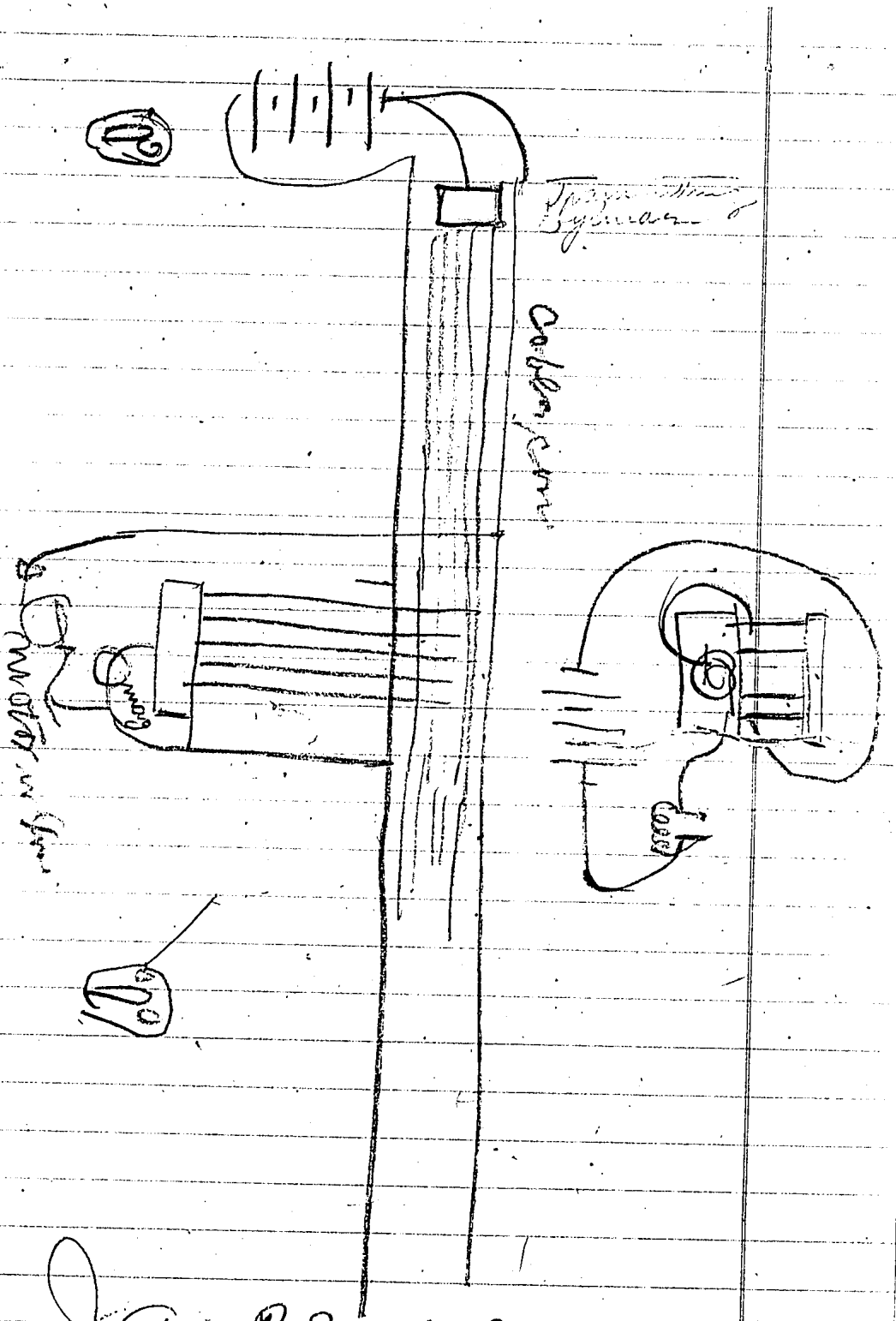
017



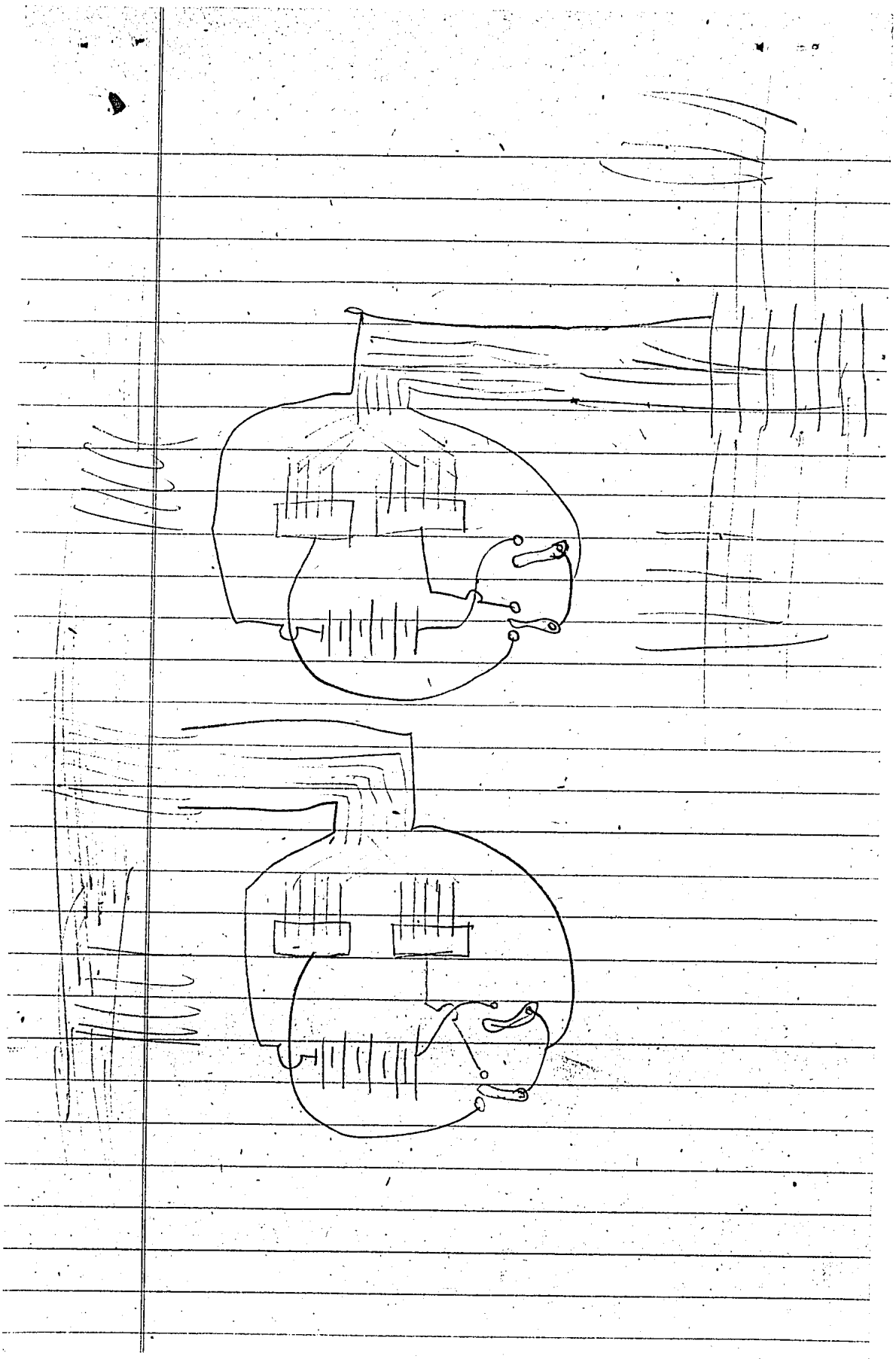


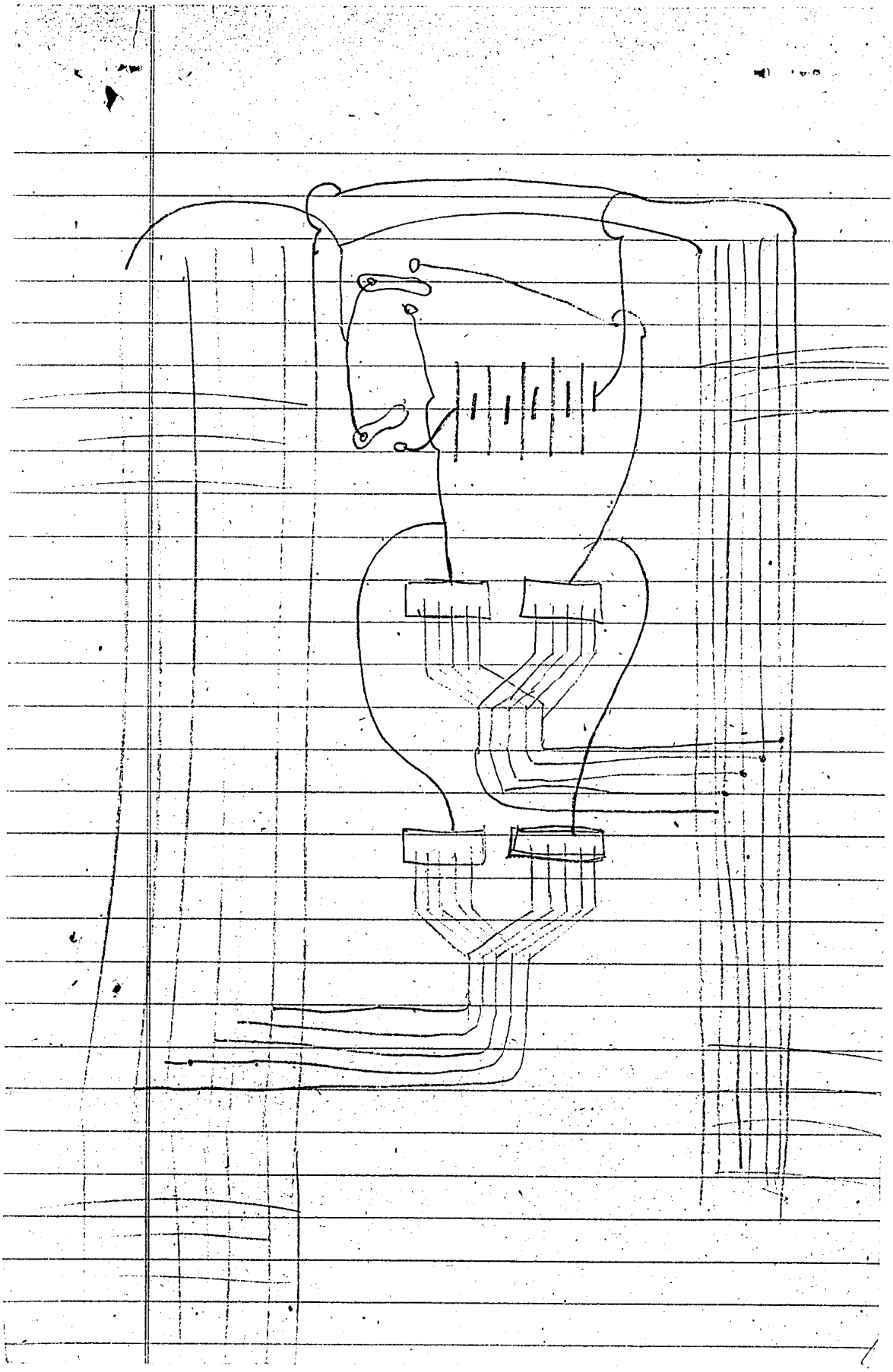






Jan 22 1884





In Views

Transmitter.

Cross section

Enlarged section fin-

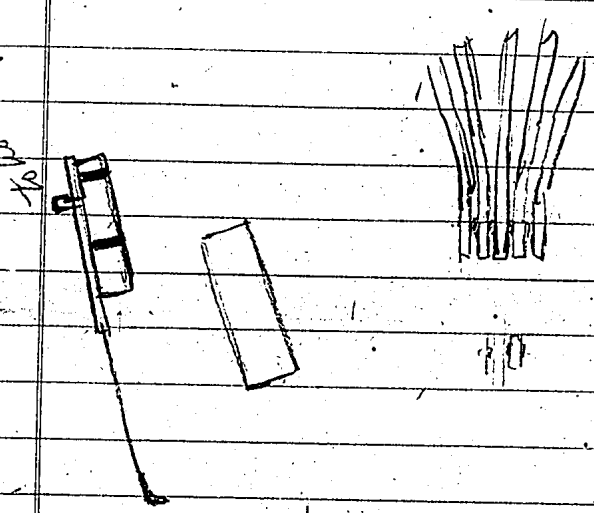
Receiver

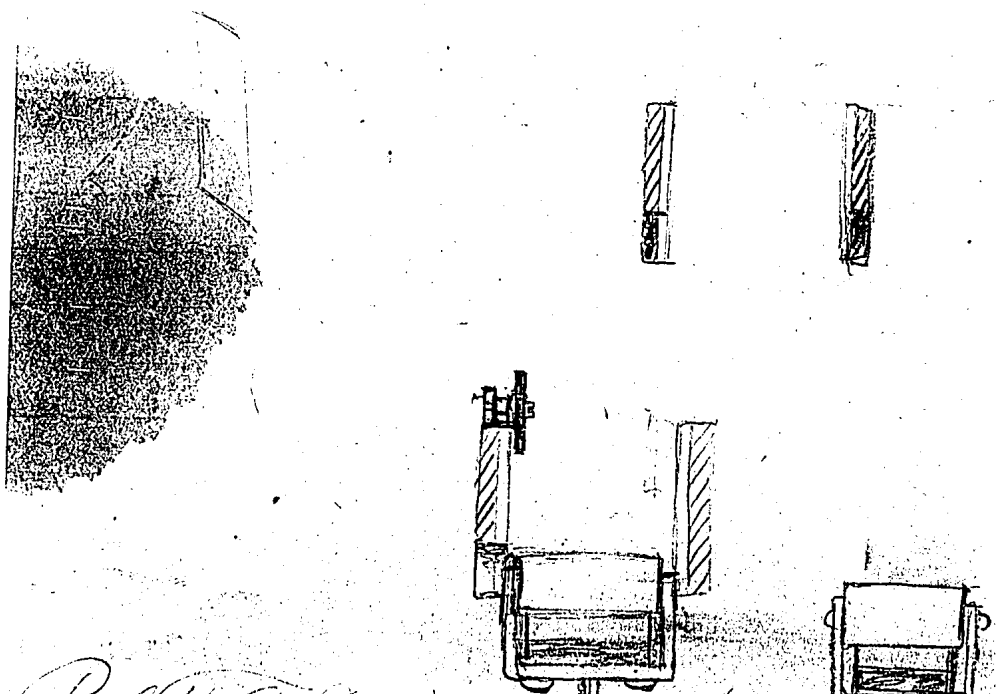
Enlarged end

end of rim.

Diagram of

Connections





Prof. Edison
Sketches of Espring
1884

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

New York, Feby 6 1882 188

Dyn=

Please take out patent
on armature in series & multiple
arc in the field of force,
preferably Multiple arc, I find
that with the present machine
with a large bar of iron &
placed across the field when
armature is running that
it does not bring down the
volts 10 per cent. The shaft
cancelling of the lines of
force through the bar is certainly
as great as would be caused
by the addition of another
armature in Multiple arc
I dont mean Multiple arc
Electrically only in relation

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to the field (re) magnetically
thus I shall be able with
very little addition of iron &
Copper to run 2 armatures from
one field at full volts =
Regarding series in Experiments
in boring out field I found by
using long field magnet with
boring out so as to give twice
the space between the iron of the
armature & the field pieces that
it only lowered Volts 15 p cent
hence by little more iron I could work
2 armatures. There is a Curious
gain here that I do not fully
Comprehend — Make broad
Claims to the increased utilization
of the Lines of force,

All Communications to be addressed to the Office.

Form 1 A.

Works, 104 Goerck Street.

# EDISON MACHINE WORKS.

OFFICE, 65 FIFTH AVENUE.

New York, ..... 188

Multiple arc

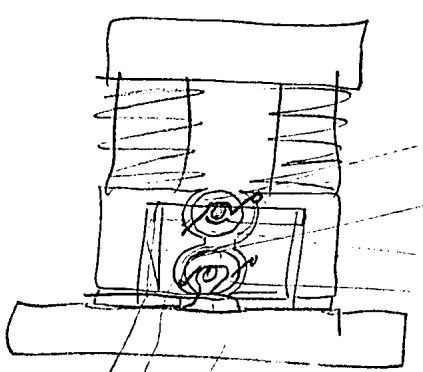
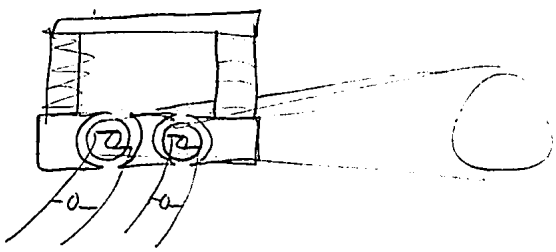


Fig 1

Series - magnetically Spkg

3



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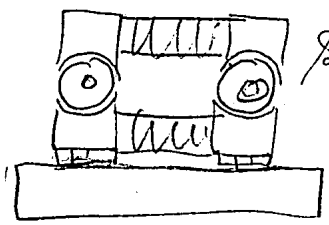
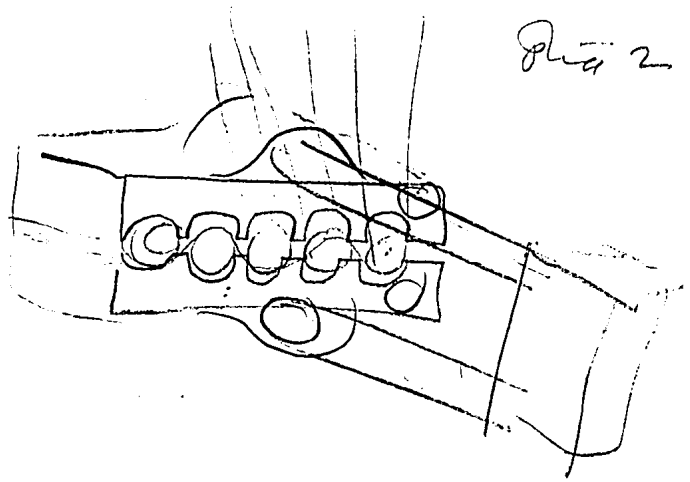


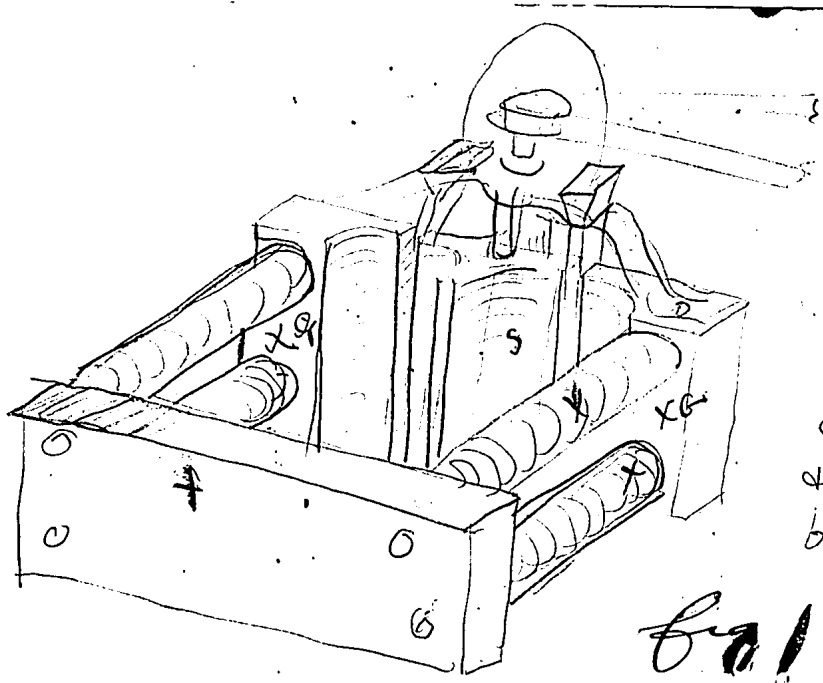
Series

February — 1884 —

THE EDISON ELECTRIC LIGHT CO.,
65 FIFTH AVENUE.

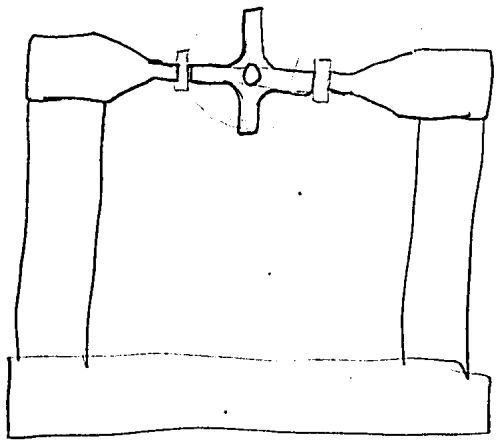
*New York,* ..... *188*



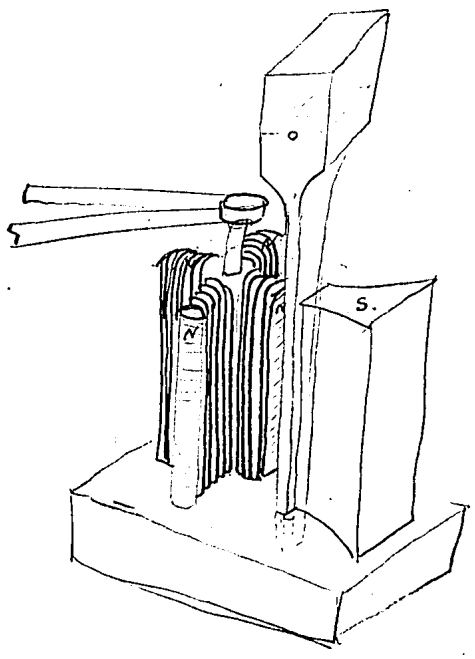


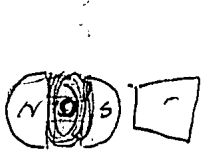
salt
also water
with pulp
going down
Continuous shred
& dividedat
bottom,

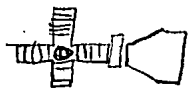
bad

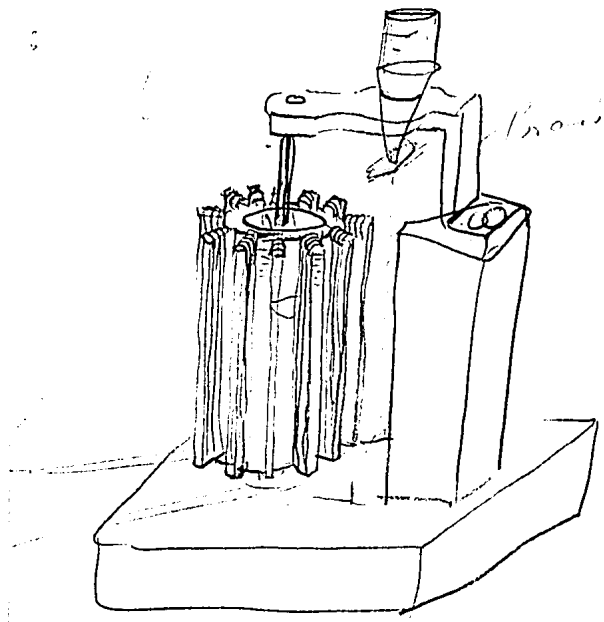


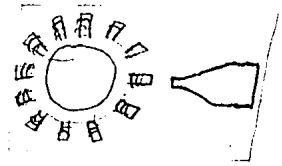
powerful fucked



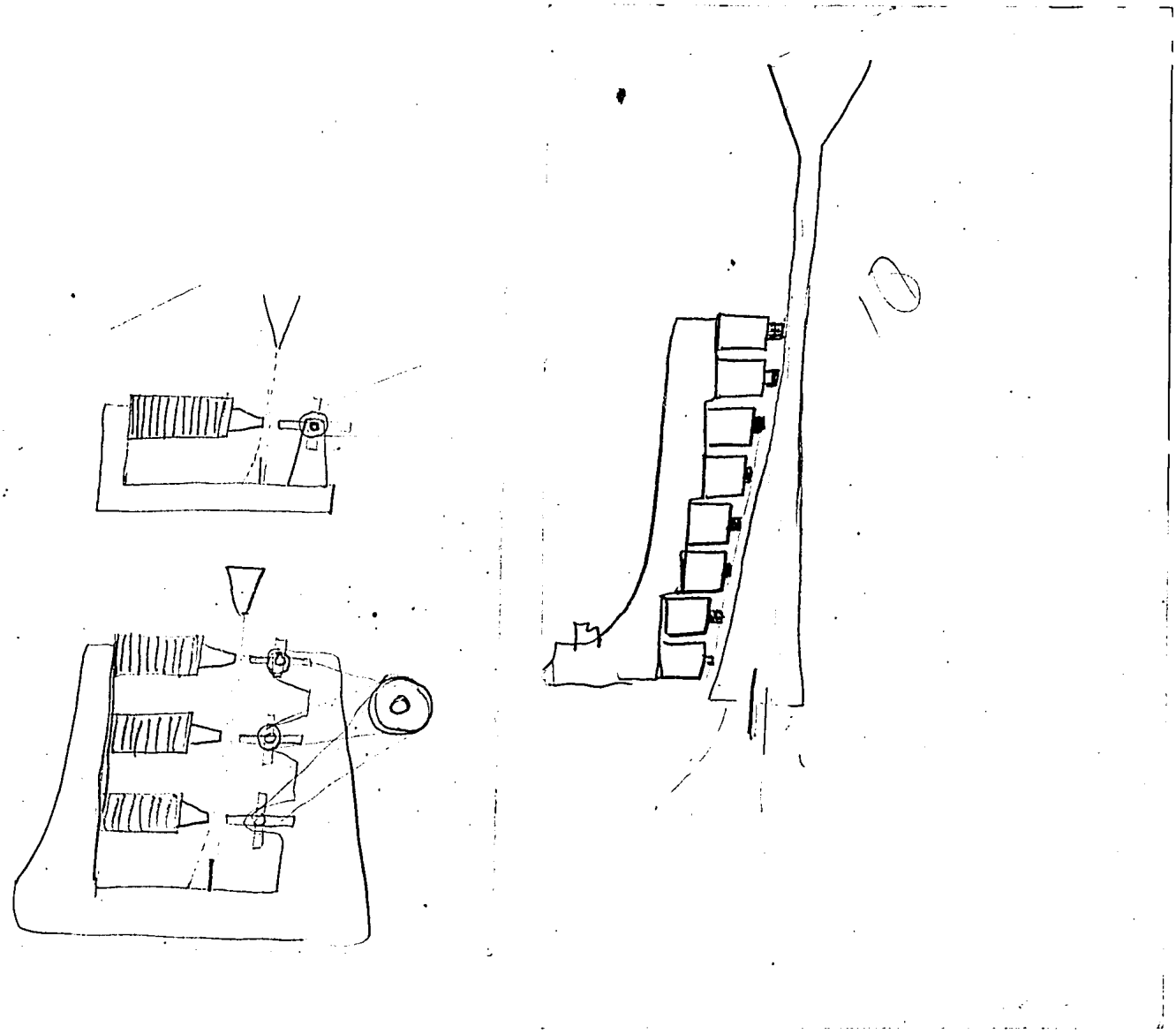



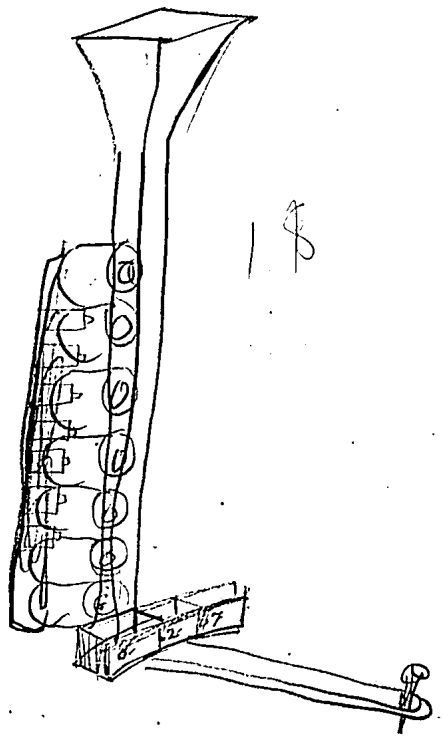


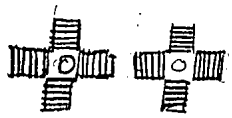


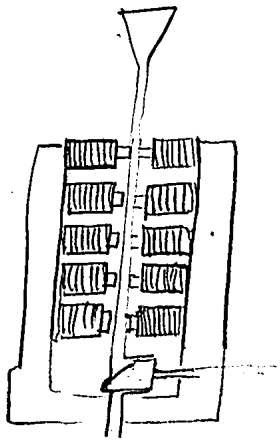
3

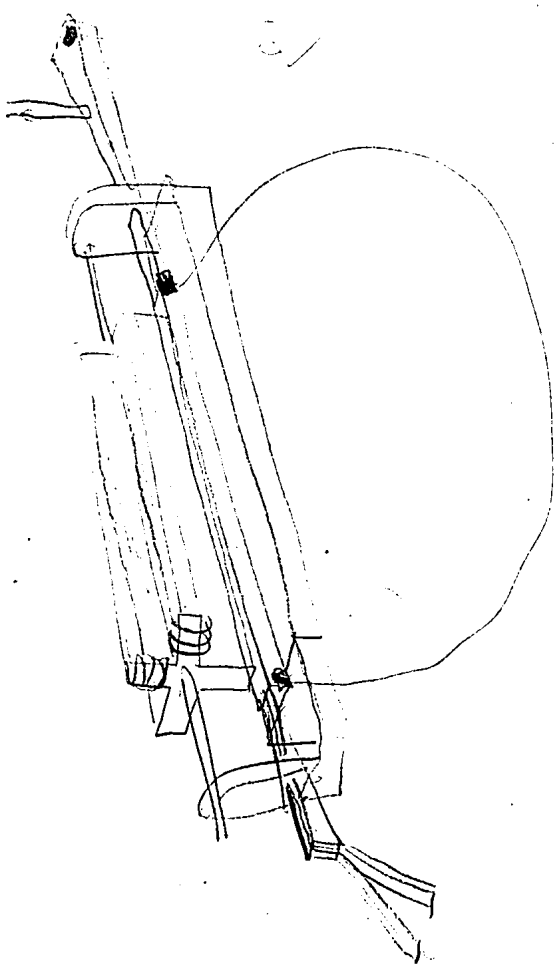
Tiffany & Co 18-8474



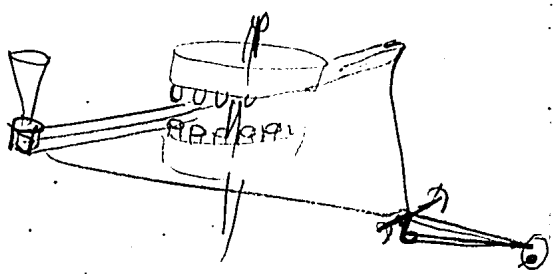


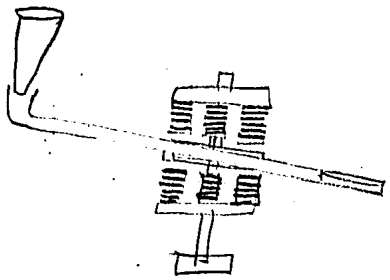


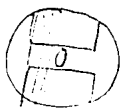


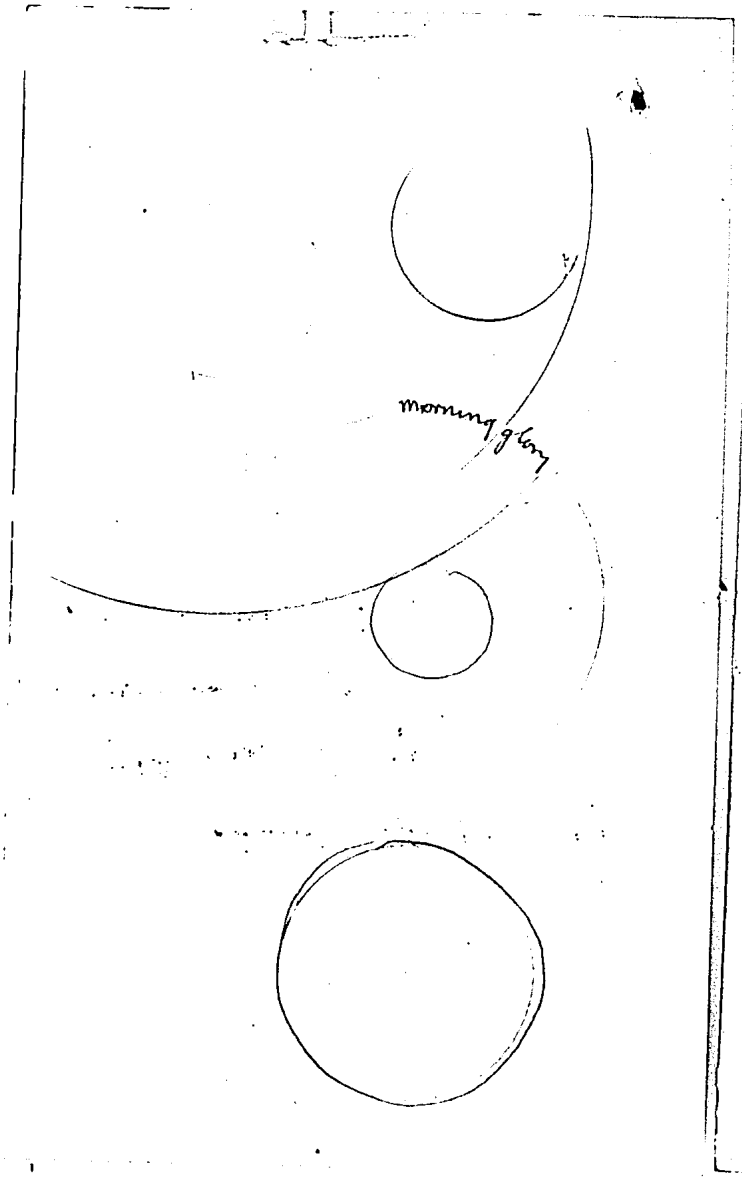


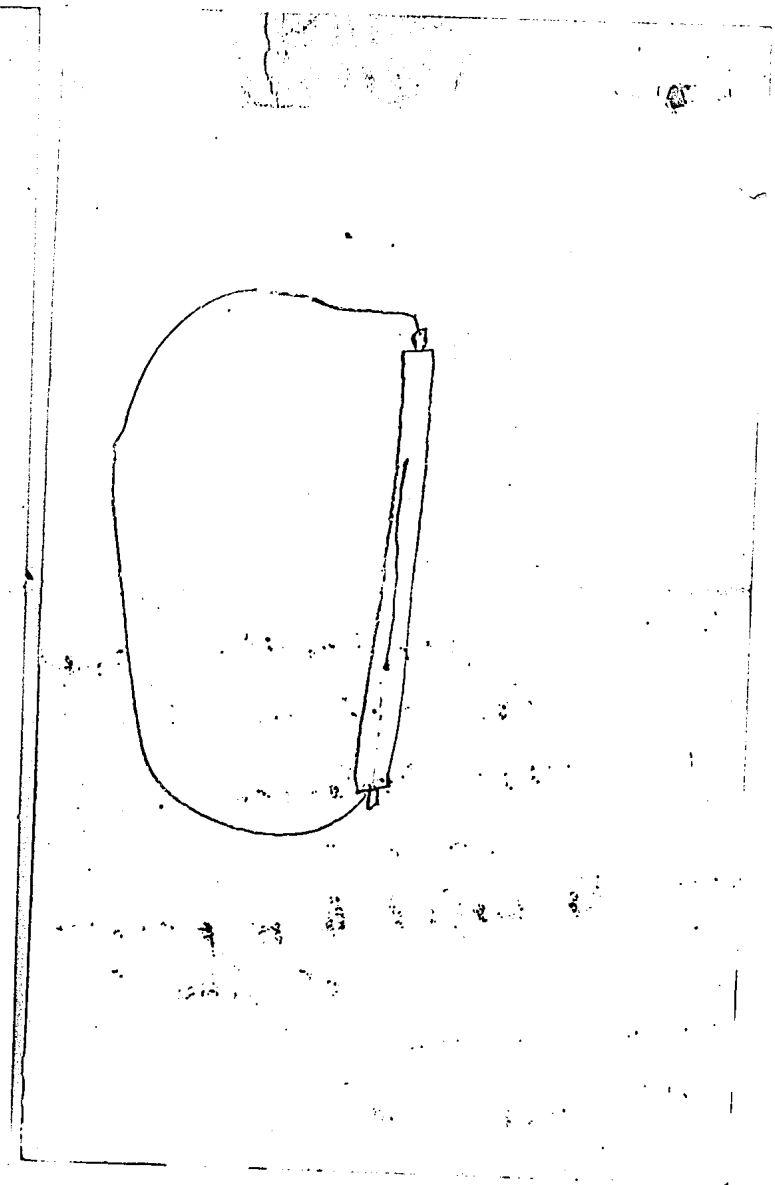
Apr 2 May 1st








morning glory



THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,

Form L. 1000-4-21-'

New York, ..... 188

Request.

The object of this invention is to seperate gold and other metals in a metallic state from the ore gangue or non metallic substances.

The invention consists in causing such gangue or ore to pass through a magnetic field of ~~force~~ so that an Electric Current is thrown into the metallic particles by their cutting the lines of magnetic force and then causing the mutual attraction between such Current in the metal and the field of force to carry the metal to a point or place of deposit different from the ore or non metallic gangue & thus produce a cheap & economical seperation of the metals from the gangue; in all these devices it is ~~is~~ it sought to seperate

THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,





New York, ..... 188

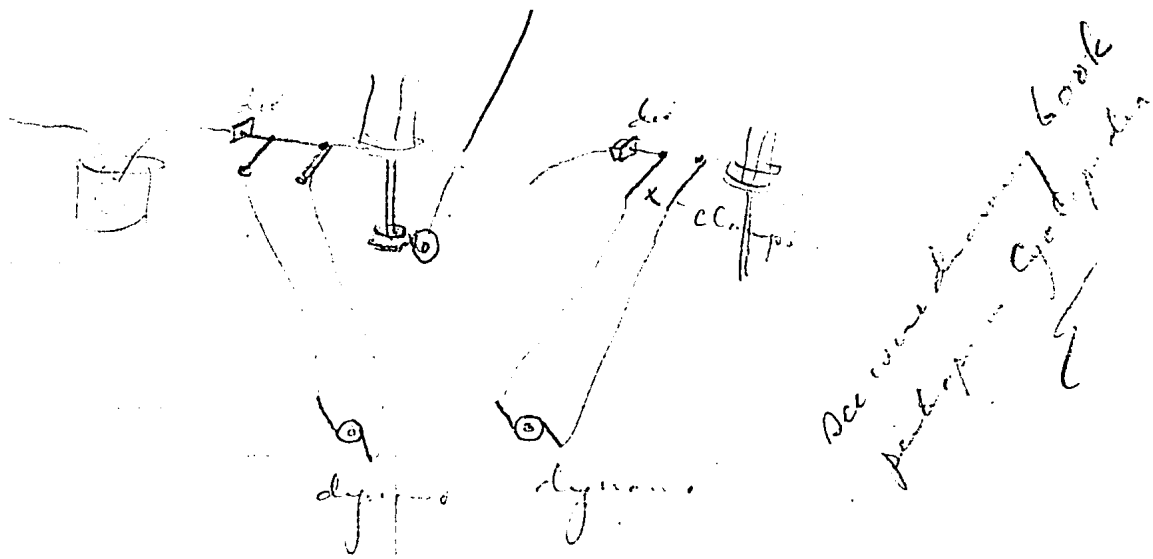
magnetic bodies such as ores of Nickel
iron Etc =.

Fig 1 Shows a powerful Vibrator Mag
X with pole piece XG - S is a rotating
armature which may or may not be
Coiled with wire to make it an
Electromagnet. The cylinder or
armature is driven by a
belt. There is a space

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK May 21 1884

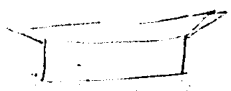
Dyn.



about 6 inches of the wires passes between contacts of the clamps or brushes X & continuous quantity current passes through this section so ... to heat it up to passes to the annealing or softening point, it may be heated between Every die for every other die. The softening of the wire makes it easier to draw through the die hence There is a saving of power & other

Drawing is really enough to [illegible] the
depression - treated by [illegible] the
gaseous exchange - saves a great deal
of labour + more over the output of the
plant + also [illegible] the
Campbell and [illegible] gives
more [illegible] - get a broad [illegible]

Edwin

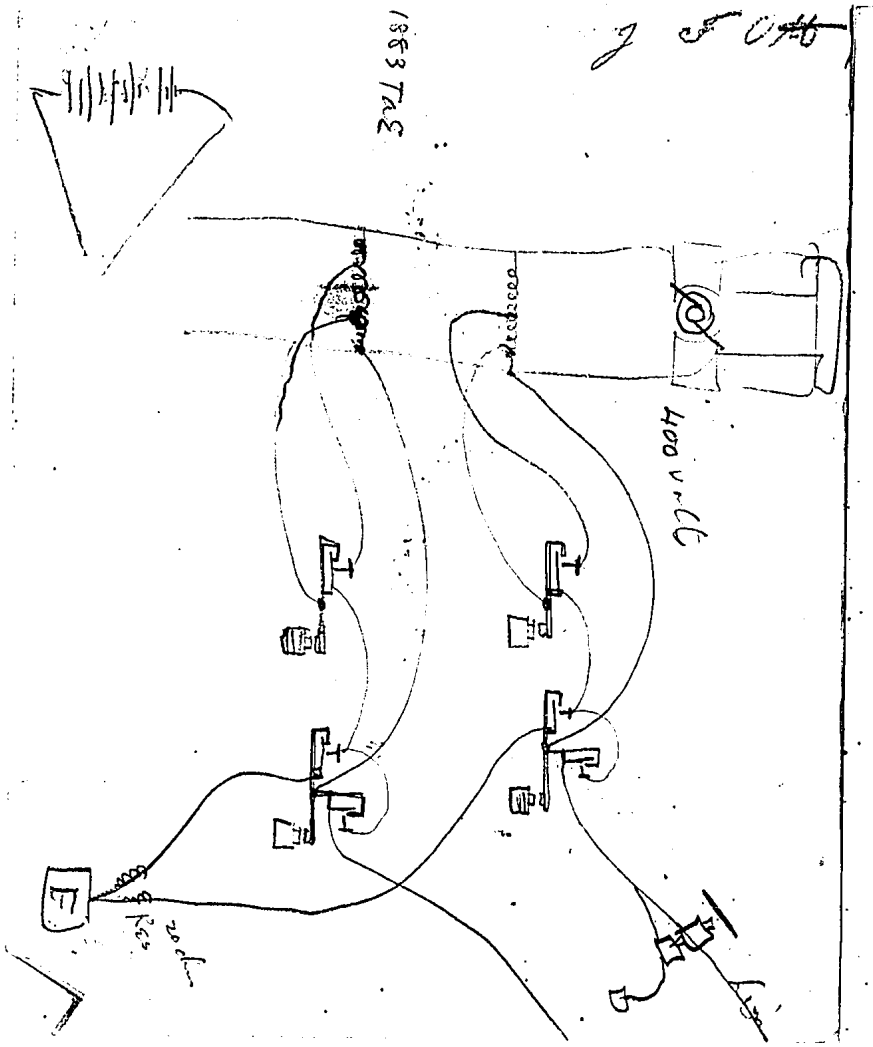


THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, May 23 1884

M. H. Foster
Tue
J F Otto

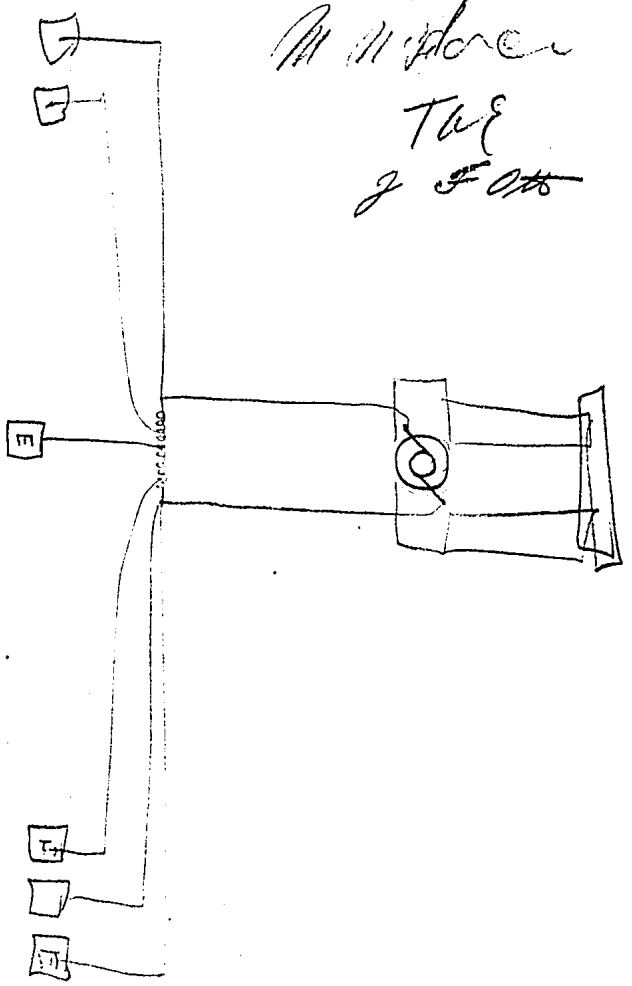
May 23 1883 Tue



THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, May 28 1884

M H Foster
Tue
J F Otto



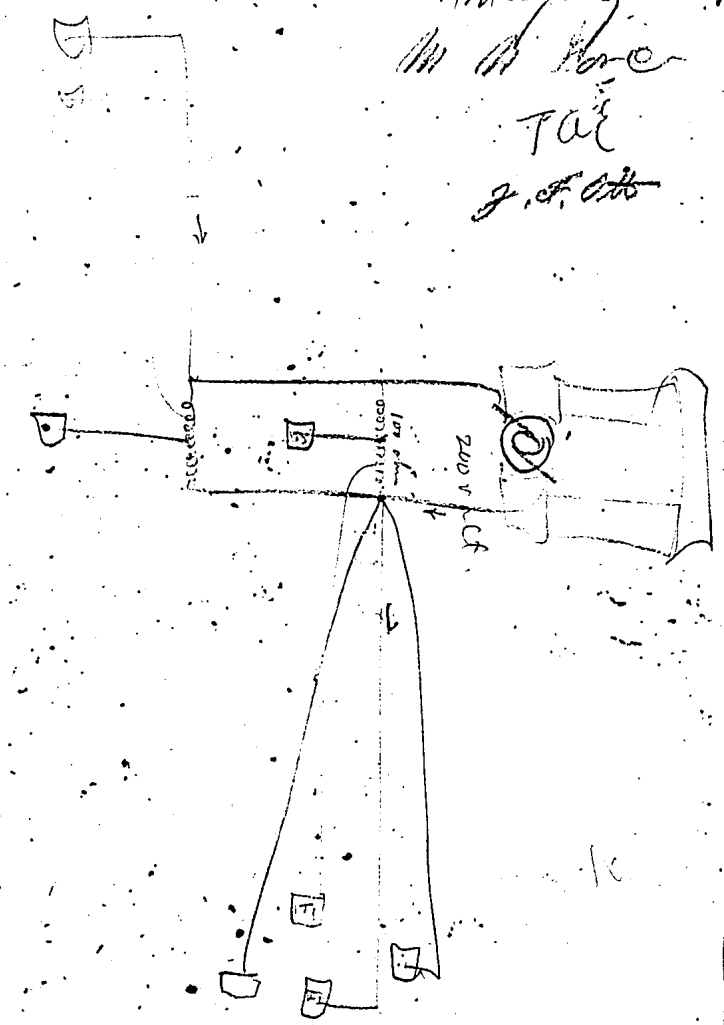
THOMAS A. EDISON,
NO. 65. FIFTH AVENUE.

NEW YORK, May 29 1884

M A Kane

TAE

J. F. Ott



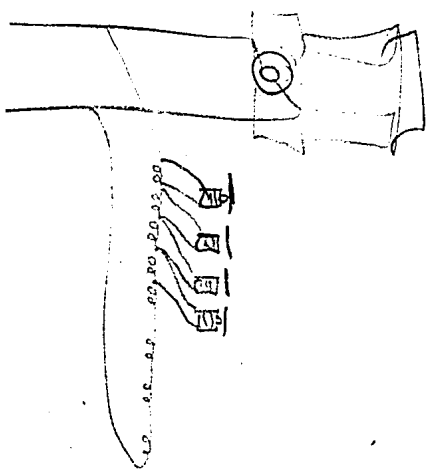
THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, May 28 1884

M A. Kane

TAE

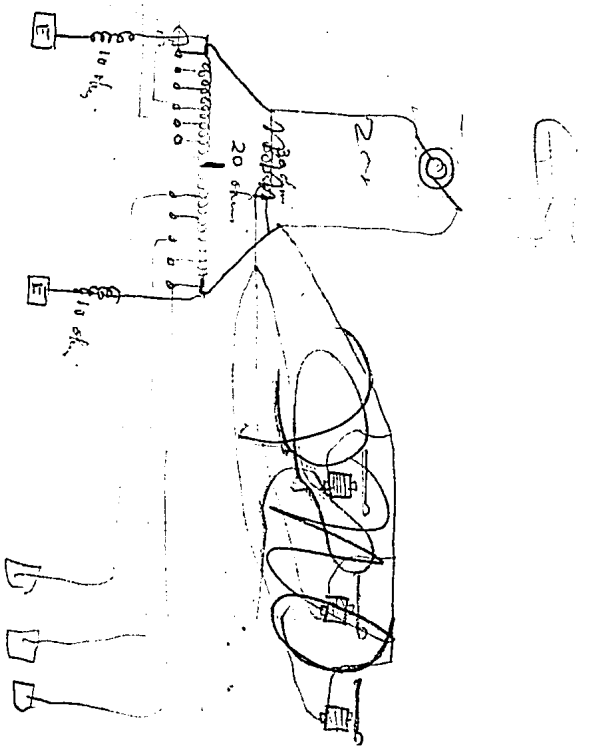
J F Ott



THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, May 23 1884

M A Forna
TAE
J. T Otto



THOMAS A. EDISON,
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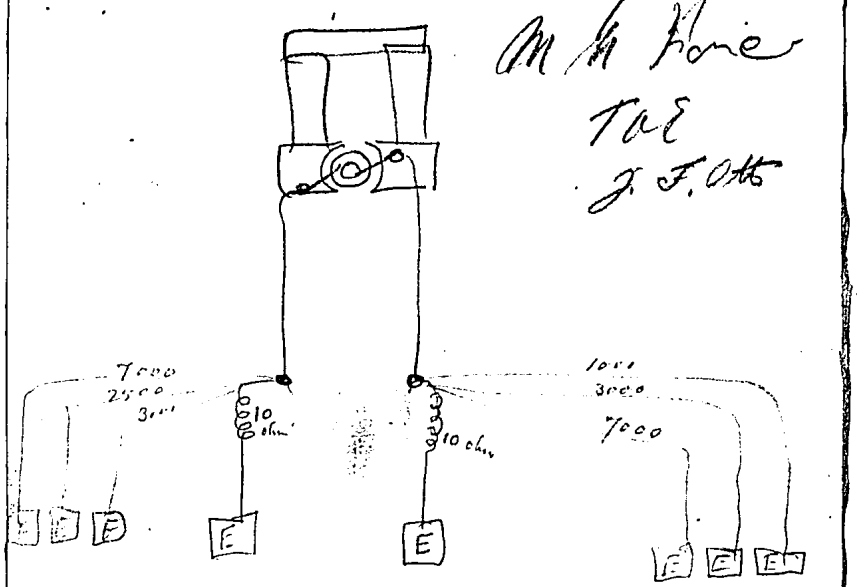

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THOMAS A. EDISON,
Central Station, Construction Dep't,
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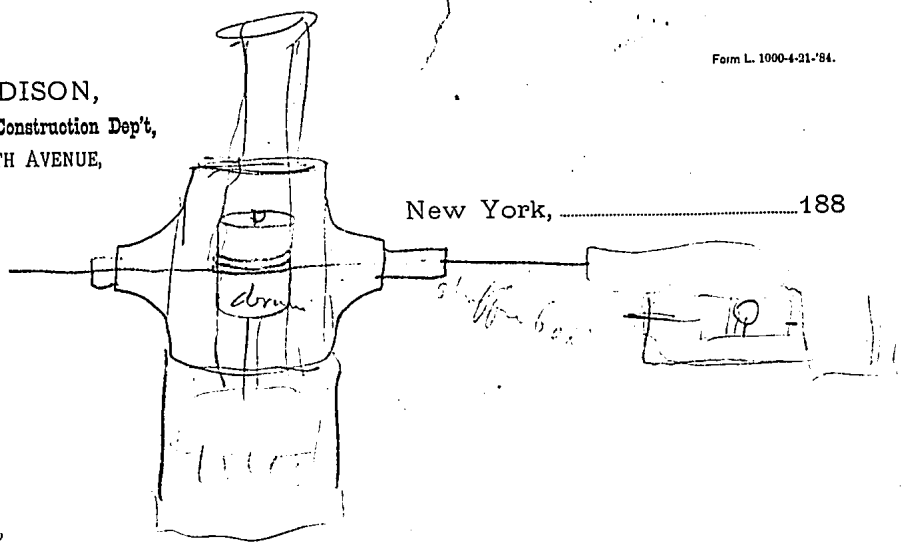
New York, ..... 188

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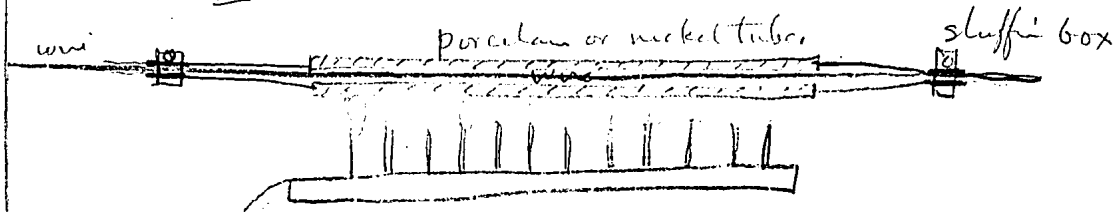
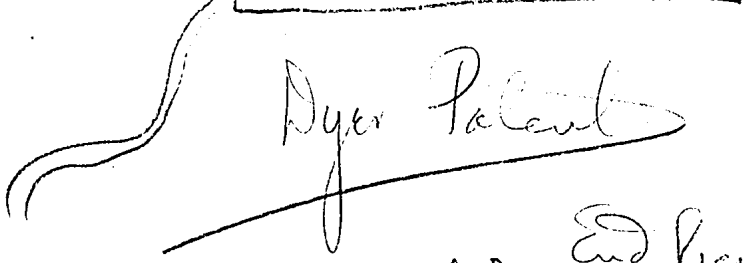
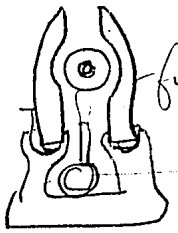


Dyer Patent May 24 1884

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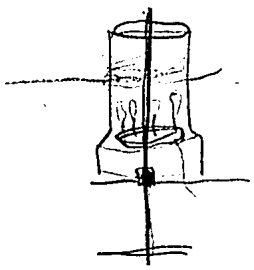
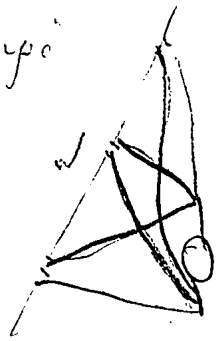
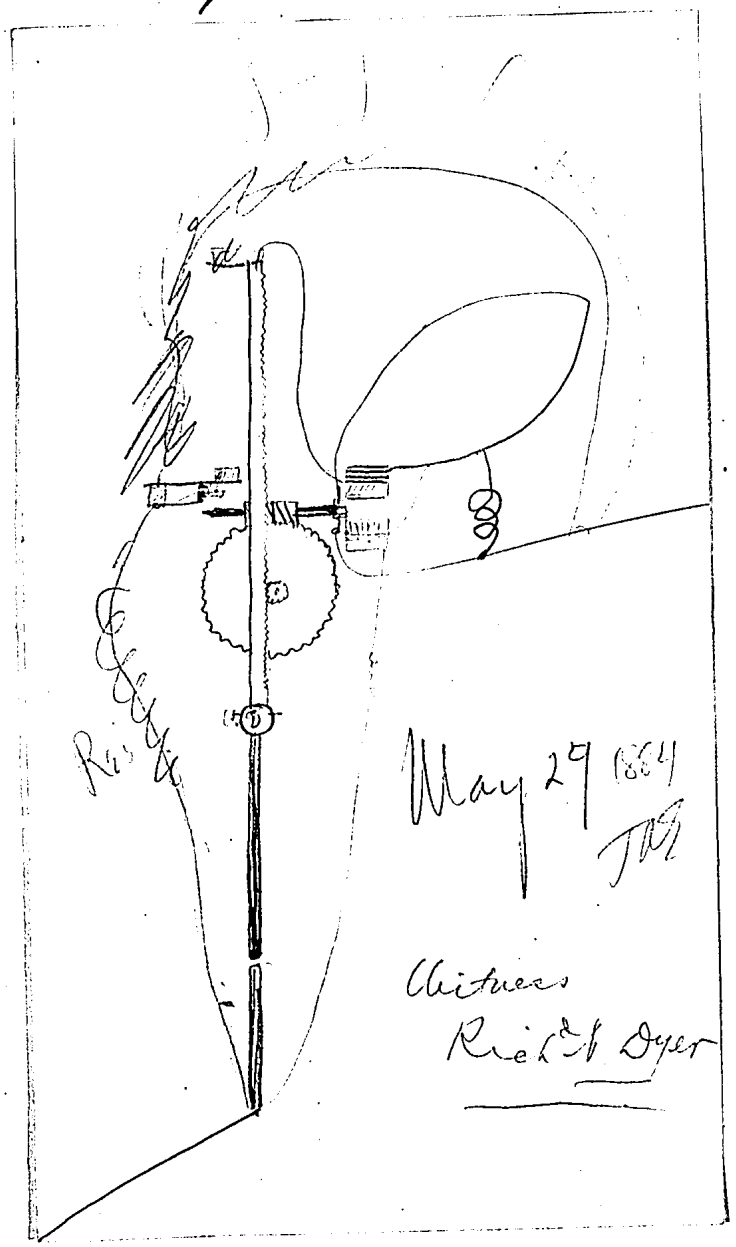




— May — 1884 —

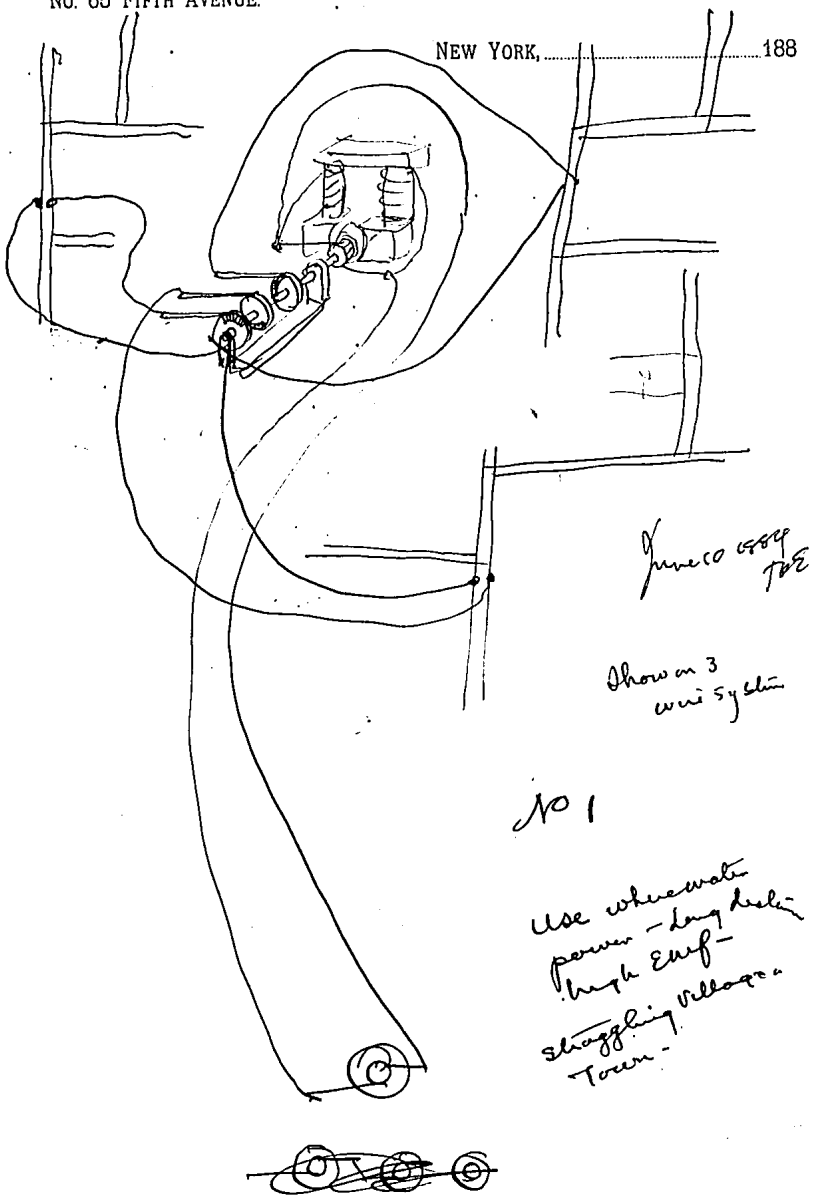


May 29 1884
JM

Witness
Richd Dyer

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, ..... 188



June 10 copy for

Shows an 3 wire system

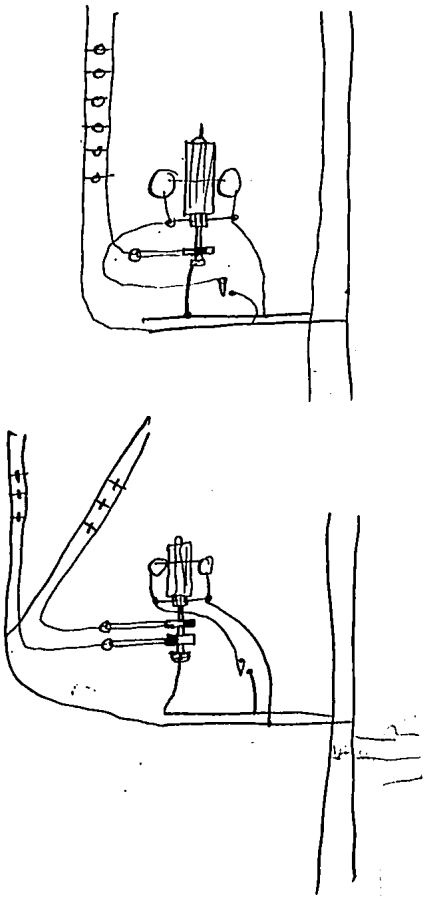
No 1

Use where water power - long leads - high Enf - struggling villages - Town -

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, ..... 188

June 10 copy for



No 2

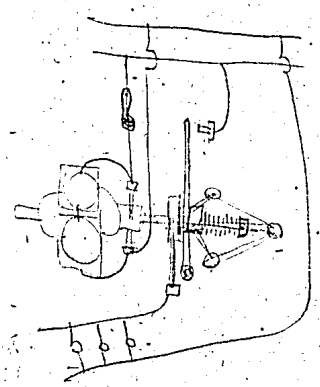
Show it on 3 wire System

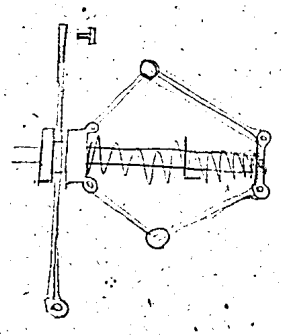
# TERMS AND CONDITIONS.

To guard against mistakes on the lines of this Company, the sender of every message should order it repeated; that is, telegraphed back from the terminus of said lines to the Originating Office. For such repeating, the sender will be charged in addition one half the usual tolls of this Company, on that portion of its lines over which such message passes.

This Company will not assume any responsibility in respect to any message beyond the terminus of its own lines; and it is agreed between the sender of the following message and this Company, that said Company shall not be liable for mistakes or delays in transmission or delivery, or for non-delivery to the next connecting Telegraph Company, of any unrepeated message, beyond the amount of that portion of the charge which may or shall accrue to this Company, out of the amount received from the sender for this and the other Companies by whose lines such message may pass to reach its destination; and that this Company shall not be liable for mistakes in the transmission or delivery, or for non-delivery to the next connecting Telegraph Company, of any repeated message, beyond fifty times the extra sum received by this Company from the sender for repeating such message over its own lines; and that this Company shall not be liable in any case for delays arising from interruption in the working of its lines, nor for errors in cipher or obscure messages. And this Company is hereby made the agent of the sender, without liability, to forward any message over the lines of any other Company necessary to reach its destination.

This Company is not to be liable for damages in any case where the claim is not presented in writing within sixty days after the sending of the message.





Blank No. 11.

CABLE MESSAGES.

# The Western Union Telegraph Company

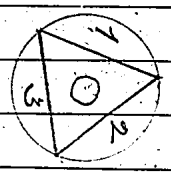
All messages destined for points beyond the United States, via the Atlantic Cables and the Cables to Cuba, which are received by this Company for transmission, will be so received and sent forward over its lines to the terminus thereof, and there delivered to the next connecting Telegraph Company, only on the terms and conditions printed on the back hereof.

A. R. BREWER, Sec'y. NORVIN GREEN, President.

_____ 188

Send the following Message, subject to terms and conditions printed on the back hereof, which are agreed to.

To _____



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To guard against mistakes on the lines of this Company, the sender of every message should order it repeated; that is, telegraphed back from the terminus of said lines to the Originating Office. For such repeating, the sender will be charged in addition one half the usual tolls of this Company, on that portion of its lines over which such message passes.

This Company will not assume any responsibility in respect to any message beyond the terminus of its own lines; and it is agreed between the sender of the following message and this Company, that said Company shall not be liable for mistakes or delays in transmission or delivery, or for non-delivery to the next connecting Telegraph Company, of any unrepeated message, beyond the amount of that portion of the charge which may or shall accrue to this Company, out of the amount received from the sender for this and the other Companies by whose lines such message may pass to reach its destination; and that this Company shall not be liable for mistakes in the transmission or delivery, or for non-delivery to the next connecting Telegraph Company, of any repeated message, beyond fifty times the extra sum received by this Company from the sender for repeating such message over its own lines; and that this Company shall not be liable in any case for delays arising from interruption in the working of its lines, nor for errors in cipher or obscure messages. And this Company is hereby made the agent of the sender, without liability, to forward any message over the lines of any other Company necessary to reach its destination.

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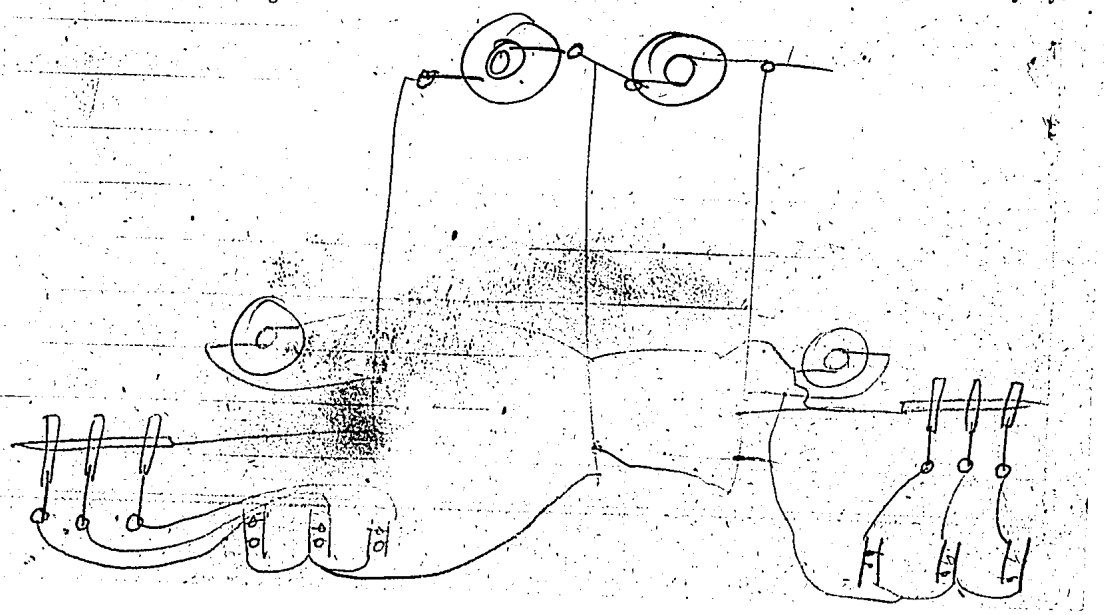

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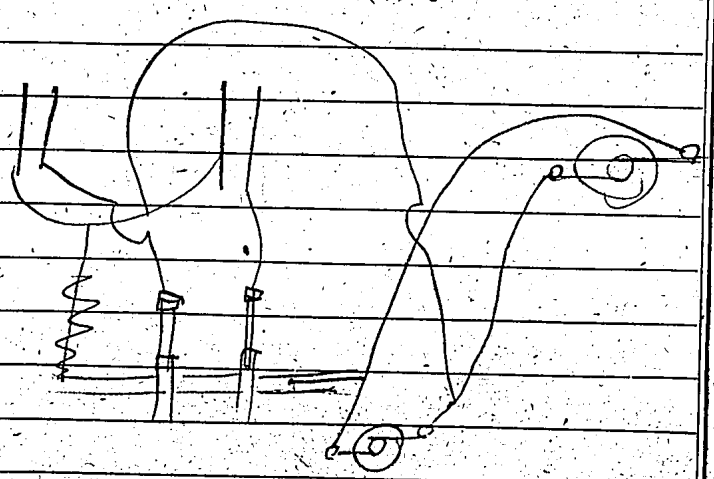
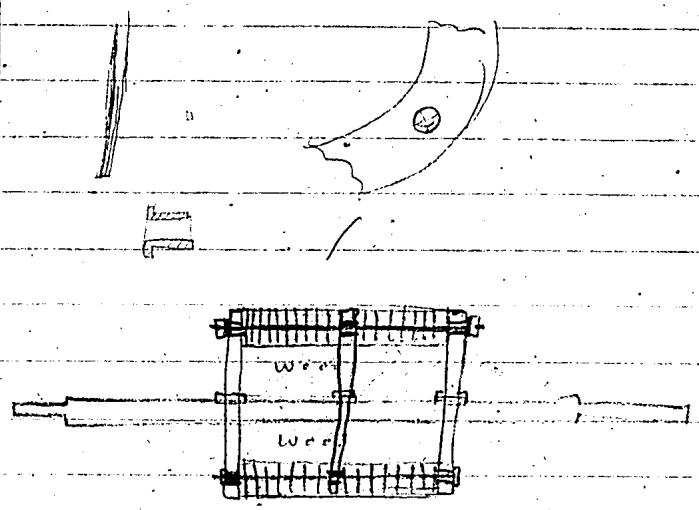
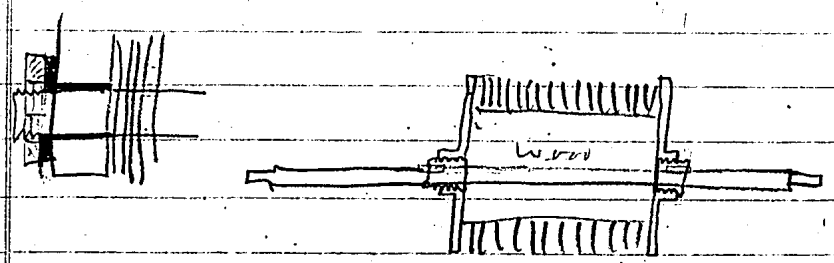
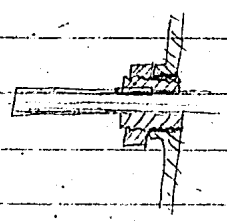




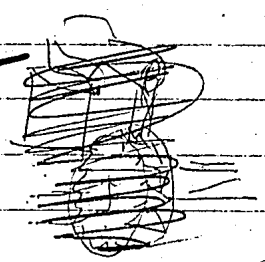

2



Nut wood washer

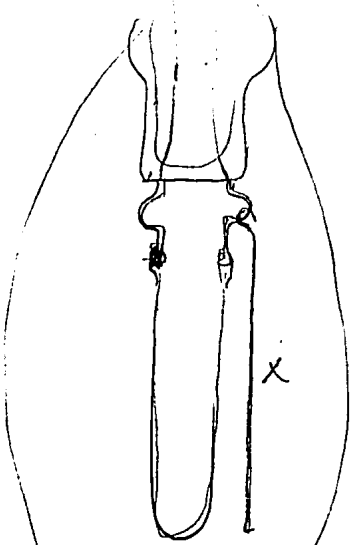
Screw

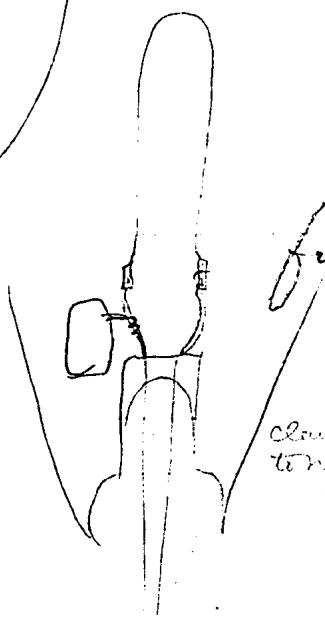


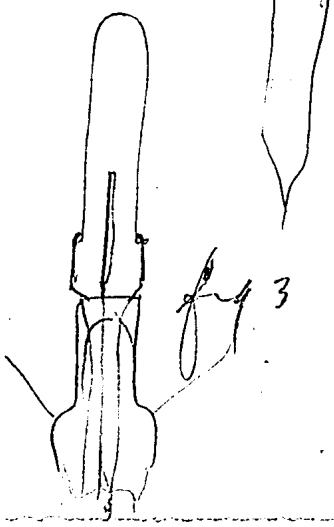
Dick.

Sept 11 1882

Think I better take out a



Ny Sept 11 1884
Tar

The object of this invention is to prevent the springing of an electric arc across the terminals of the filament of Carbon within the Vacuum Chamber during the process of manufacture

The invention consists of increasing the area of the positive metallic terminal within the Vacuum Chamber with the Carbon filament to enable the current to drive out the occluded gases, by passing the current through it - and afterwards removing the increased area from the chamber before finishing the Lamp -

The terminal of Lamp may be of any desired shape that will permit a metallic or Carbon wire or piece to be attached or detached within cavity from it.

X shows a piece of platinum wire - which on closing the points in the tube 9 then the Lamp is sealed at N — fig 2 shows the increased area permanently attached to the positive of Lamp

— September 1884 —

2

While using 3 shows the
unused area connected
to a 3rd. area passing inside
of the chamber Electrical
Connection being made outside
the chamber, down with the passage
pole, Light + disconnected Negative
Electrode from Battery
Retaining Key 1 is pressed
NO 2 retaining key is pressed
following wire from the
unused area 5 the Electrical
Current which is diminished by connecting the
large area pole with the neg. pole before diminishing
or cutting the area of both
Plates negative area
But the Ohms no greater only
the pole on which the Blue
halo appears to be required
to increase the area

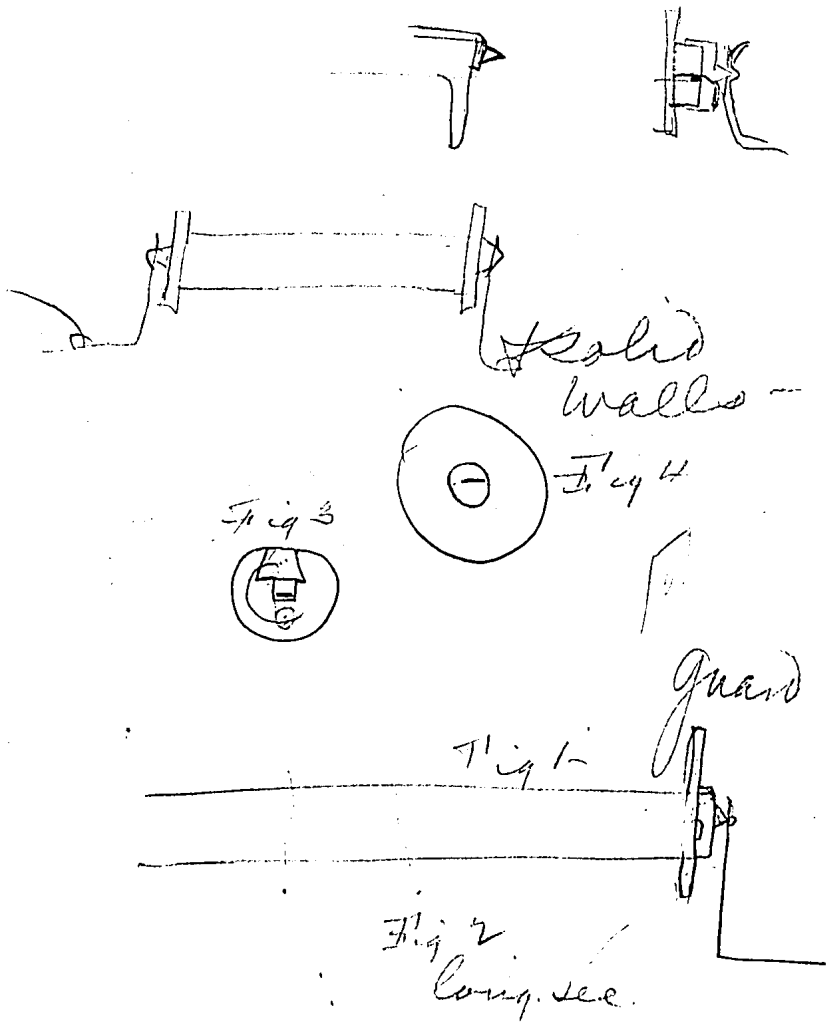
Claim. Increased area
to positive pole upon which blue
halo appears giving diminished
& subsequently discontinuing

Remaining area from use

Remaining area by diminishing or cutting off
Chamber area after key to neg wire & disconnecting

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, ..... 1884

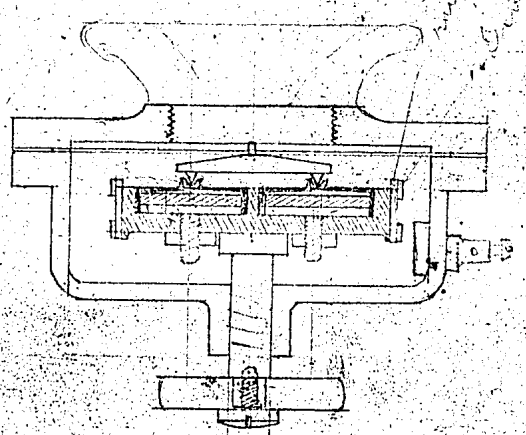


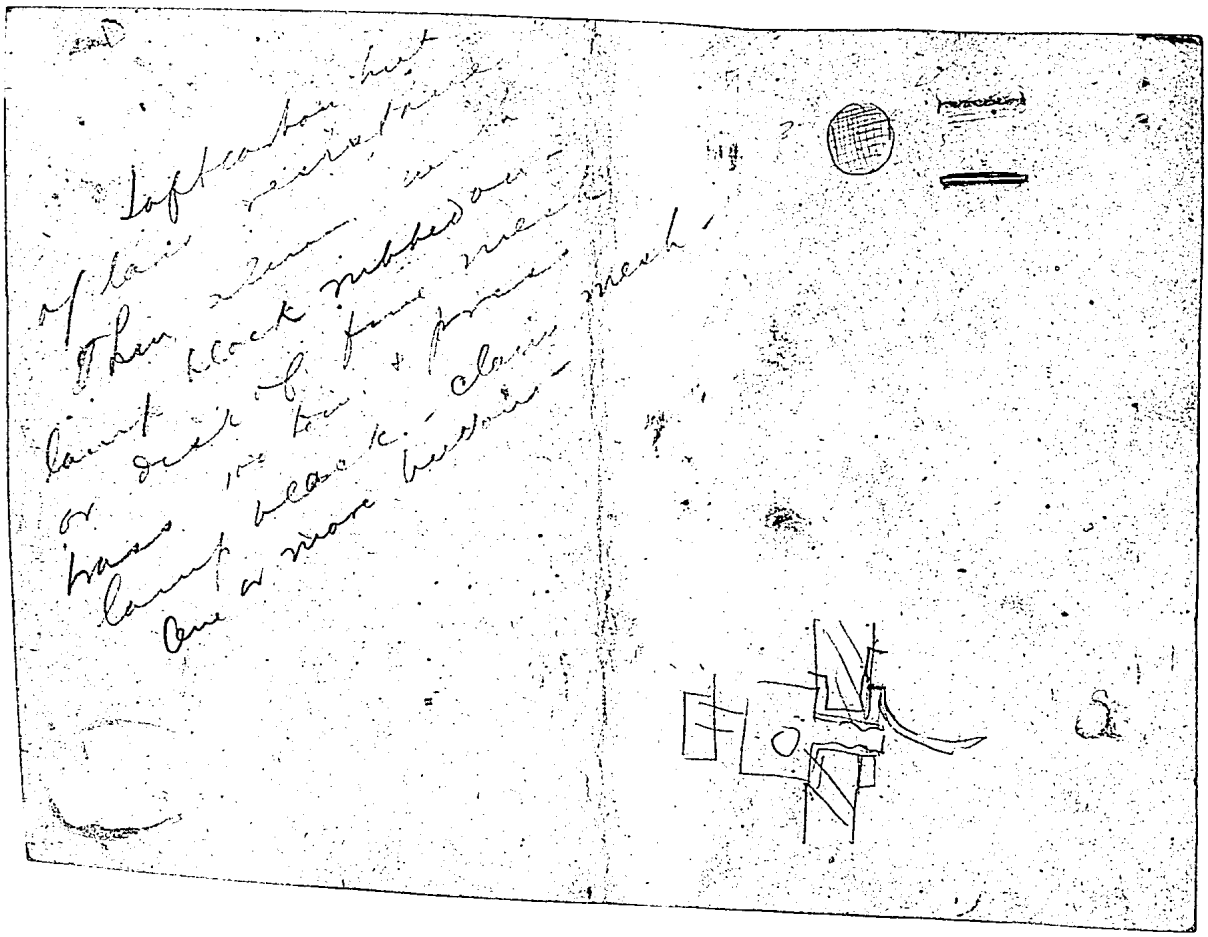
Kuesst

Laboratory of T. A. Edison

Dec. 6 - 84

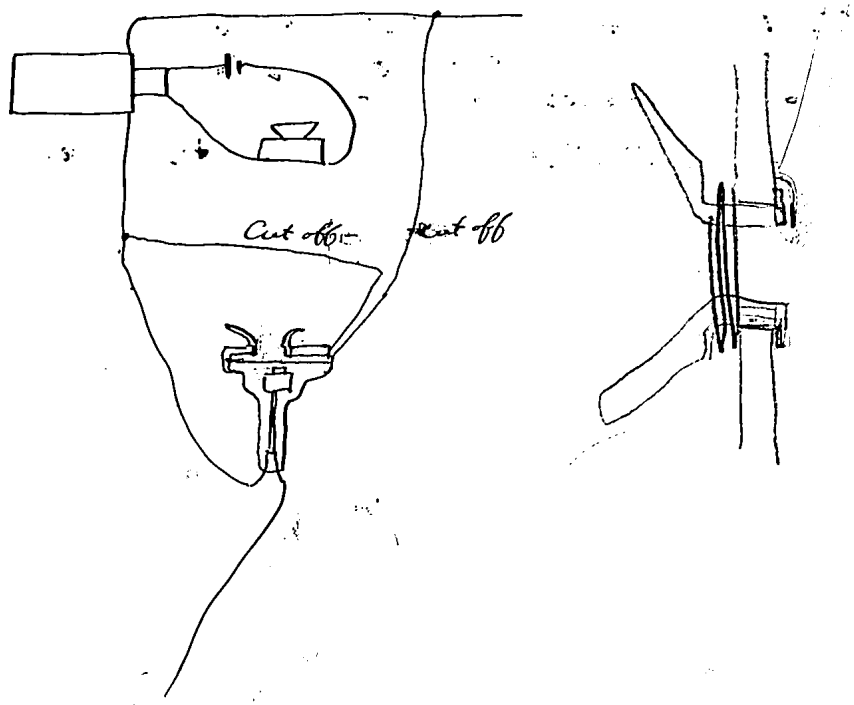
J. F. Ott





THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

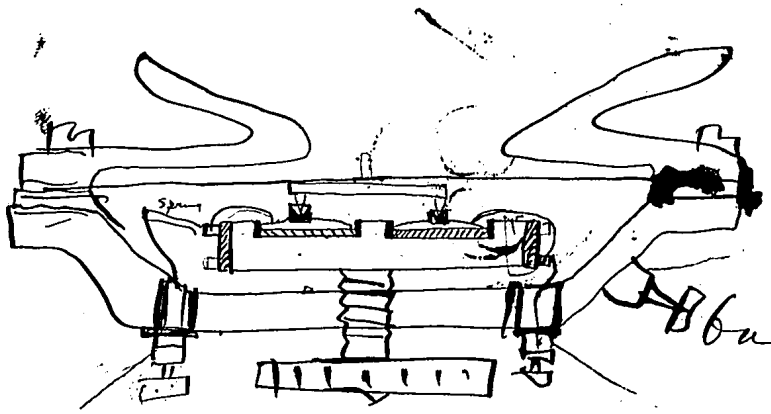
NEW YORK Dec 11 1884



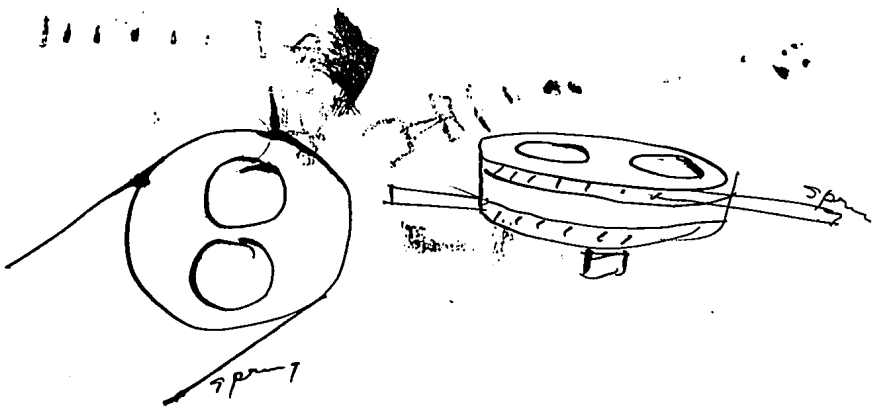

Dear = New appa = You know that in transmitting it is necessary to have the Secondary (2) the induction Coil in circuit but not essential in Receiving The induction coil by its Extra current knocks the talking down nearly 1/2 now if it could be Cut out when receiving it would be good thing. I arrange the mouth or rather ear piece of the receiver Loose if have an extra movement given to which the party presses it harder on the ear the Ear piece will go inward + close a circuit

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK Dec 13 1884



Base connection



Dyer — New Transmitter.

Button can be put in Multiple arc, or in series — Confining diaphragm to case —

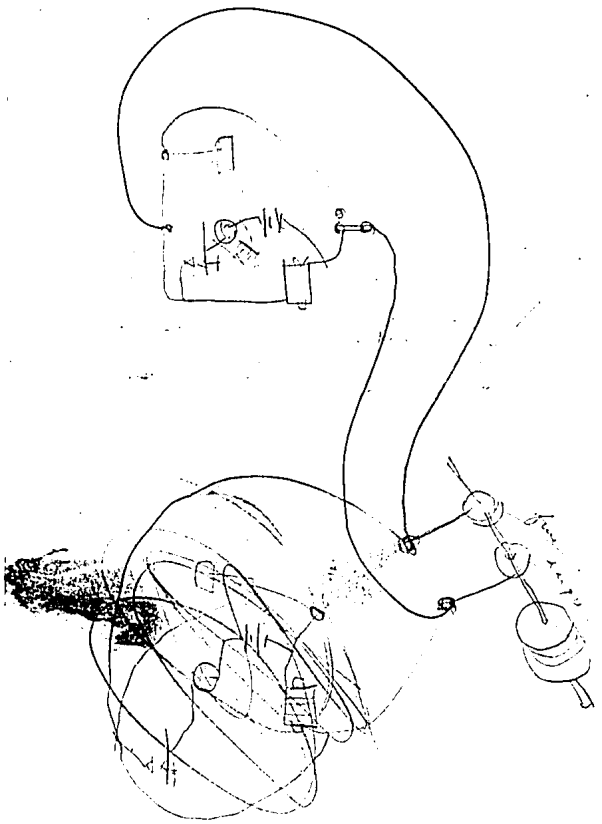
## Technical Scrapbook, Cat. 1151

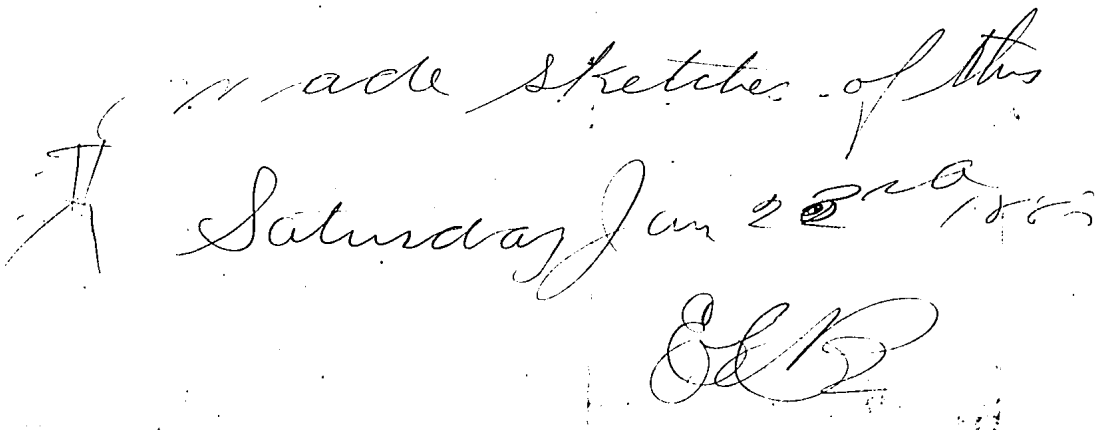
This scrapbook covers the period January 1885-December 1886. There is also one document from 1889. The entries are by Edison. Included are numerous notes and drawings relating to lamps, along with occasional material about other parts of the electric lighting system, such as generators, meters, and regulators. There are also many notes and drawings dealing with telegraphy, including the phonoplex, railway telegraph, quadruplex, sextuplex, and air or balloon telegraph. There is also a description of a method for producing artificial mother of pearl. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney. The name of Edward C. Rowland, Edison's patent draftsman, appears as a witness on many of the documents. The case number of Edison's patent application has been written on some of the items.

CABLE ADDRESS—EDISON, NEW YORK.

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, .....188




made sketches of this
Saturday Jan 22nd 1876
E. L. B.

Subject.

W.H. FORBES, PRESIDENT. WM. R. DRIVER, TREASURER. THEO. N. VAIL, GENERAL MANAGER.

THE AMERICAN BELL TELEPHONE CO.

No. 95 MILK STREET.

P. O. DRAWER 2.

Boston, 188

In reply to yours

No.

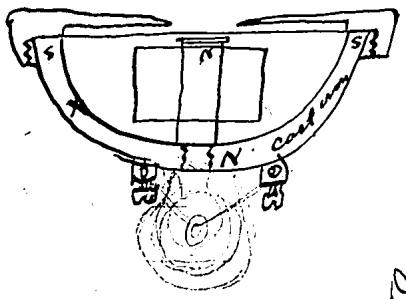
Illustrate of claim —

In telephone Recr a ~~Cap~~ Y iron or steel pole ~~pole~~ the ~~Cap~~ Y

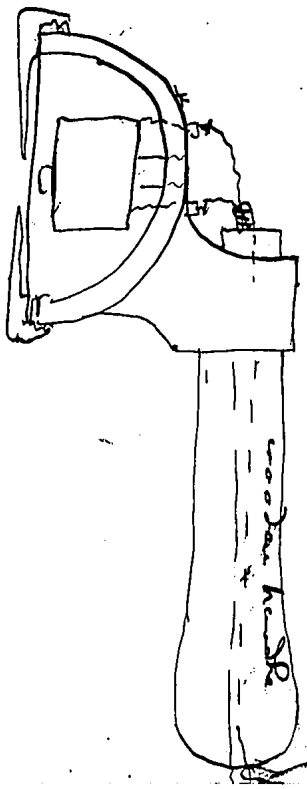
Wrought iron or preferably annealed pole upon which the ~~Cap~~

rests the Cap the ~~Cap~~ Y the ~~Cap~~ Y the ~~Cap~~ Y the ~~Cap~~ Y

pole is an ~~Cap~~ core proy to the cast ~~Cap~~ pole ~~Cap~~ Y




X Cast iron hardened & unmagnetized - or Cast steel - or dropped steel -




Dyer - Gilliland has got out best receiver I ever saw but the Co's patent man says nothing patentable now I think there is

So please draw up a brief Spcfn & claims & send on to Gilliland - There's no money in it for you directly but it will help you

Jan 85

1st Rise elevation
2- rest section line
3 - Lor. " 3 - 3

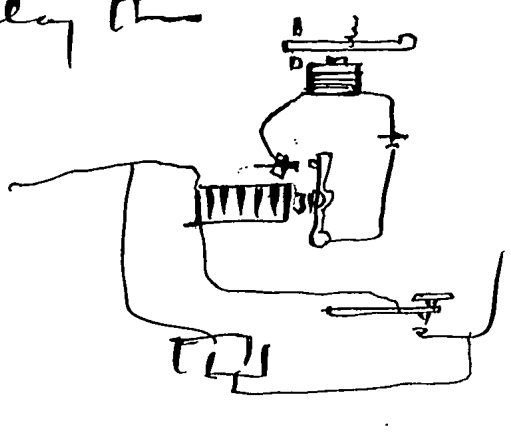
Sec 34

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, ..... 188

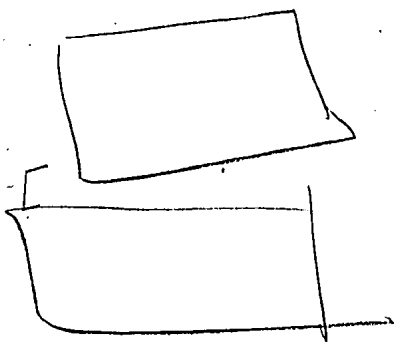
Eck

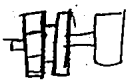
On regular Morse
set in drawing you show
2 relay one of which you
call a sounder it is customary
to make sounder different from
Relay the

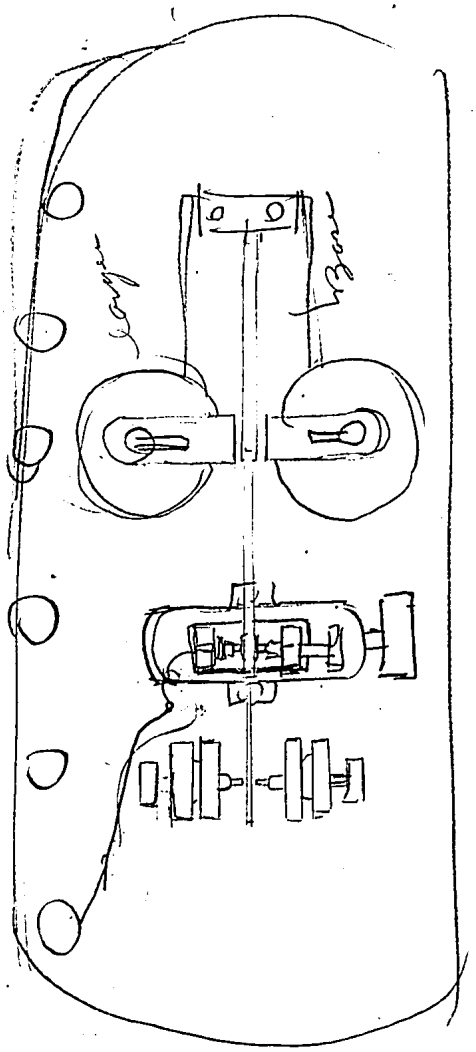


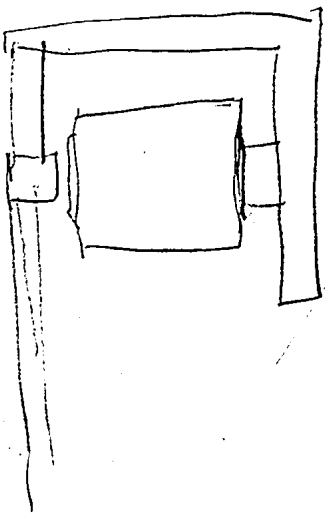
April 1885

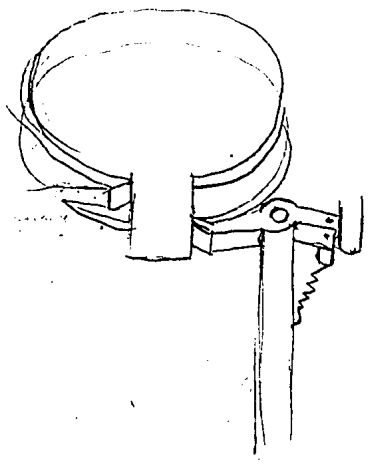
April 1885
662



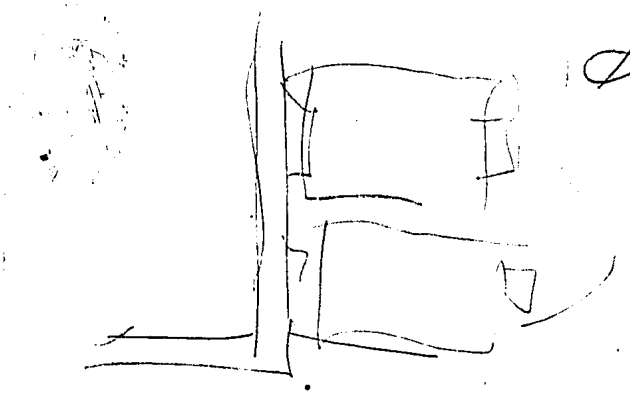


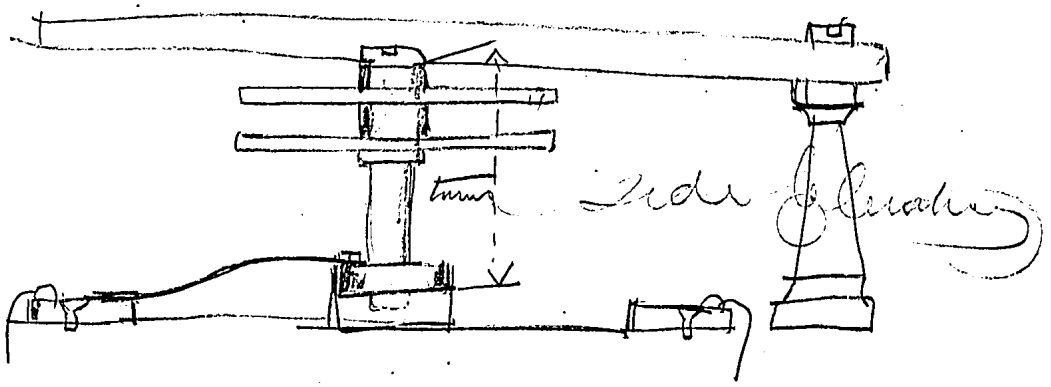


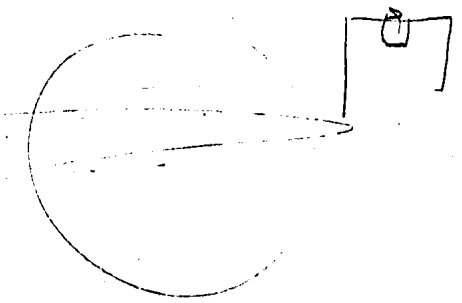


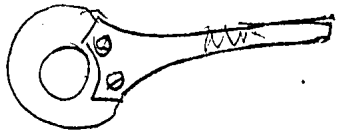


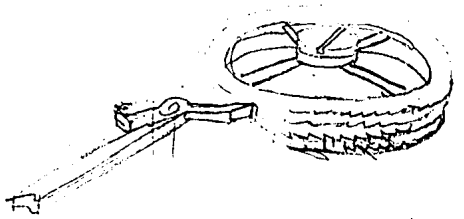
April 1885

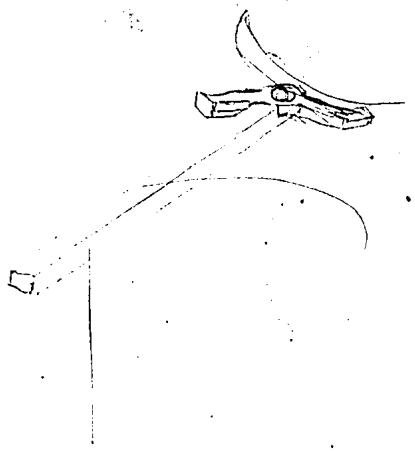












THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Form L. 1900-2-13-'86.

New York, 188

Dyer—

Have I a patent on an ordinary governor (Steam Eng) made to lift a lever up & down according to the speed: which lever simultaneously raises or depresses several levers or springs provided with contact points all in series: as the current is taken in several places simultaneously to prevent spark and these points put right in a main circuit. The governor being run by a motor for regulating the motor speed by cutting off the entire current at intervals if not I know I have it in some regulators but have I used it to regulate motors. if not a good claim can be obtained prepare a patent.

Down at Menlo a long time ago all made dies were drew tubes etc through round dies to make even cylindrical fibres, we made only a few lamps — I now want to take the subject up again — Can I apply for a patent and get claims for a cutting die — not a drawing die but one that cuts so that fibre or woody matter

See description in models of Edison round fibre Case

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE

New York,

188

Apr 11 86

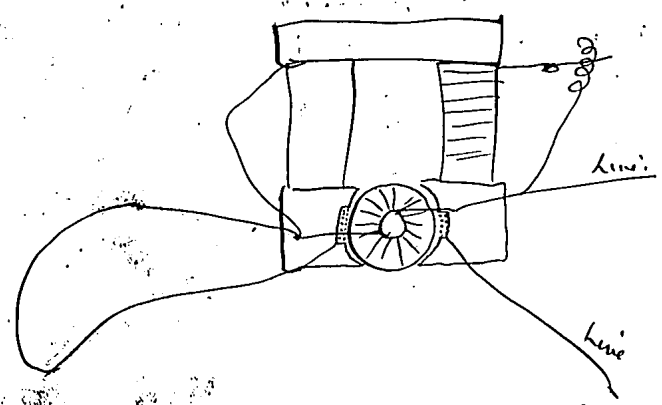
Form L. 1000-2-18-'86.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

New York, ..... 188

(2)

Can be cut to shape — whether the discs are split or solid (12) holes —

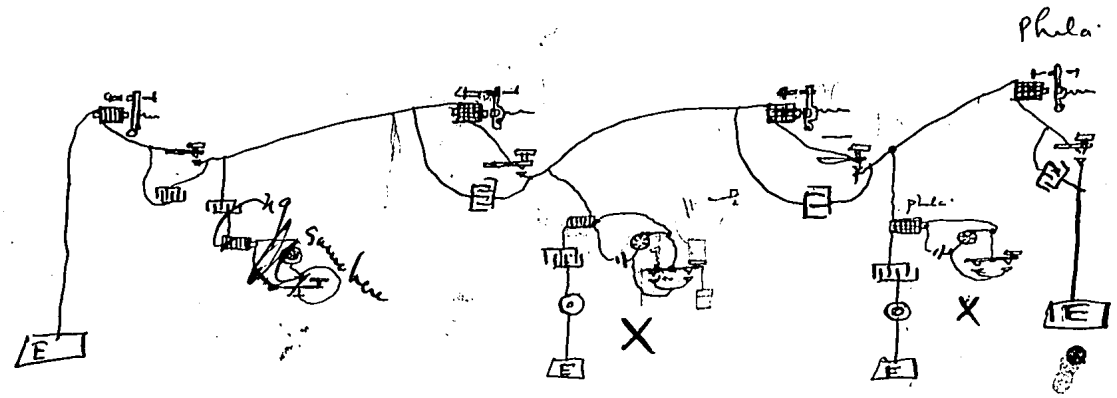


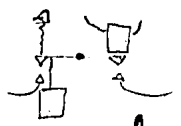

Patent this — part of the face of the field to cut away and large wire wound parallel with the armature wire + with a carrying Capacity Equal to the armature and so arranged as to resistance current and turns of wire that its magnetizing Effect is Equal to the wire on the armature,

The Current from the armature is passed through this fixed coil in such a direction that it magnetizes the armature just the opposite to the magnetization due to the wire on the armature - this causes the armature to have no magnetic

NEW YORK, _____ 188

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.



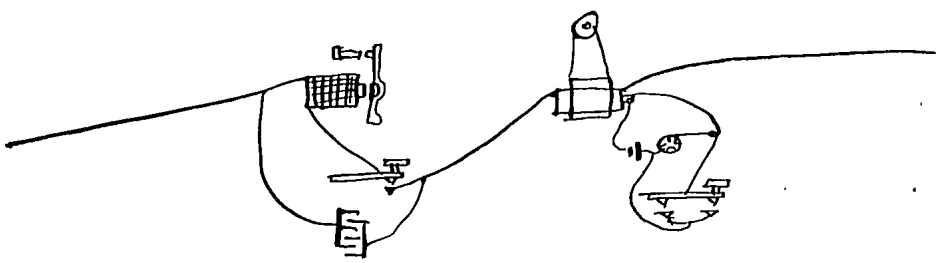



one X at Each station,
at Terminals only Condenser round Key
at all intermediate Stations Condensers around
Key & Relay —

Type No 1

NEW YORK, _____ 188

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

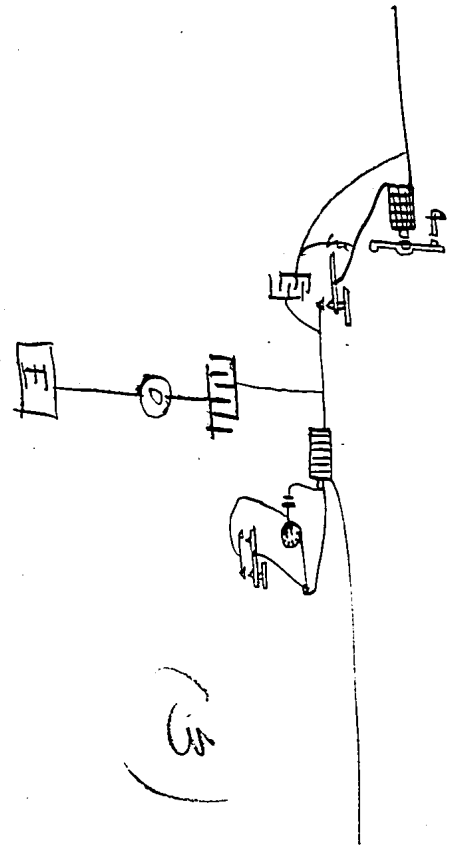


April 27th, 1885.

April 27th, 1885

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, _____ 188

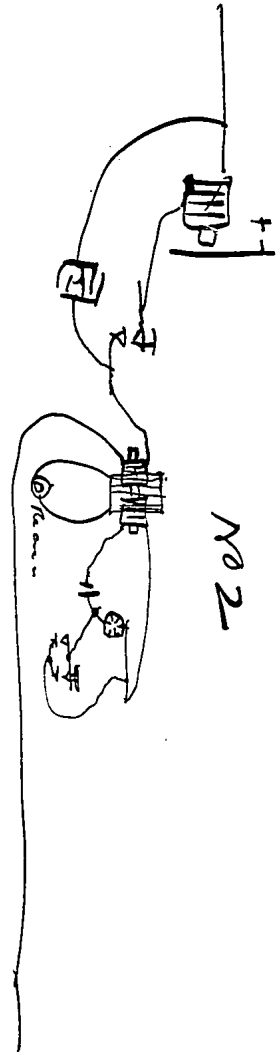


Type X

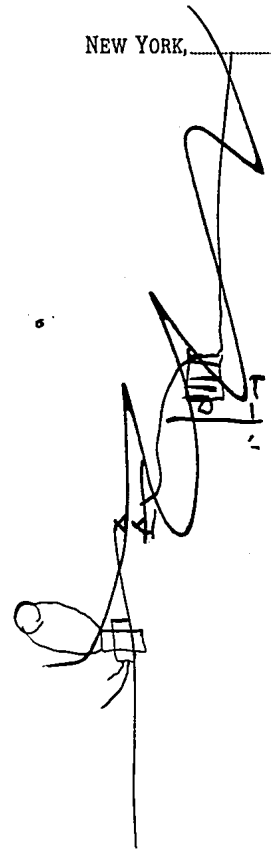
(3)

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, _____ 188



No 2



NEW YORK, _____ 188

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Type 2




(4)

Condenser may be arranged as in Type 1 – other way preferred –

NEW YORK, _____ 188

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Type 3



(5)

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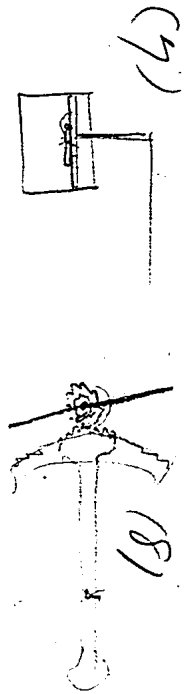
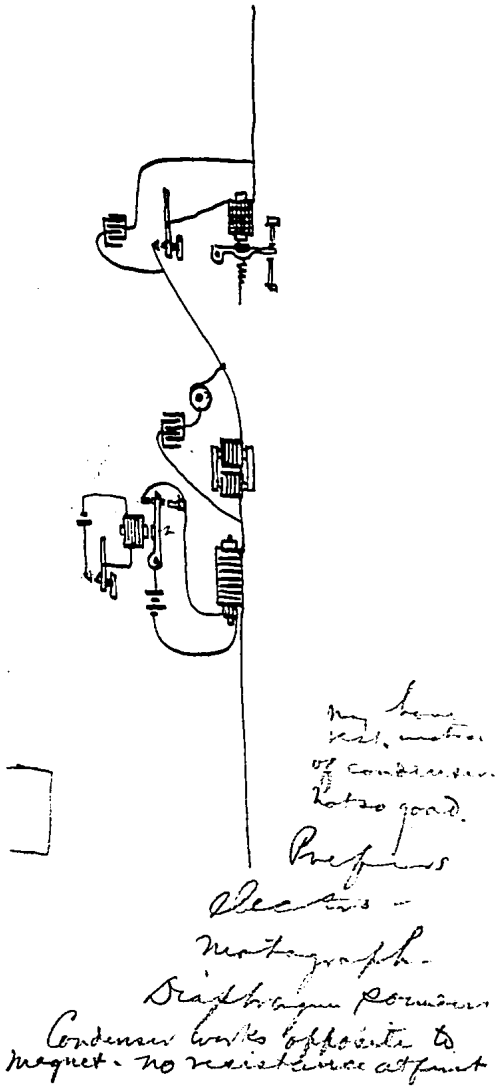
No. 65 FIFTH AVENUE.

NEW YORK,_____ 188





my [illegible]
[illegible] motor
of condenser
Not so good.
Receiver
Electric
Motograph
Diaphragm Receiver
Condenser works effective to
magnet. No resistance at first

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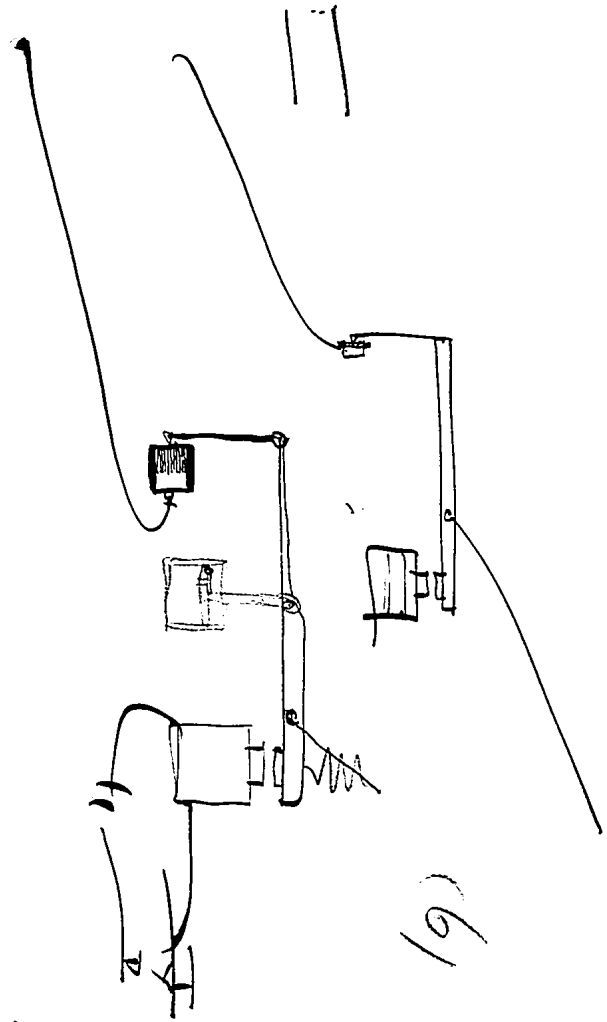
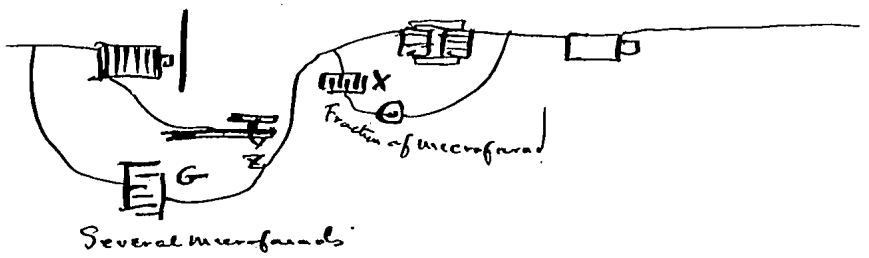


THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, 188




Dyer Here is important fact to base claim on - The sound on telephone is just as loud with 10/1000 of Microfarad in X as with several microfarads while the worse writing heard on the telephone increases in loudness + disturbing factor as we increase the microfarad capacity of X Hence claim such a capacity of X as will diminish the ~~noise~~ regular noises below the disturbing point - on the other hand the disturbing power of ~~the~~ regular noises is diminished if capacity of Condenser G is increased

Edison

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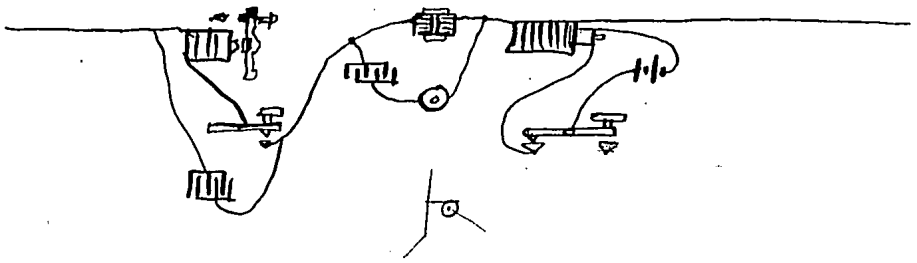
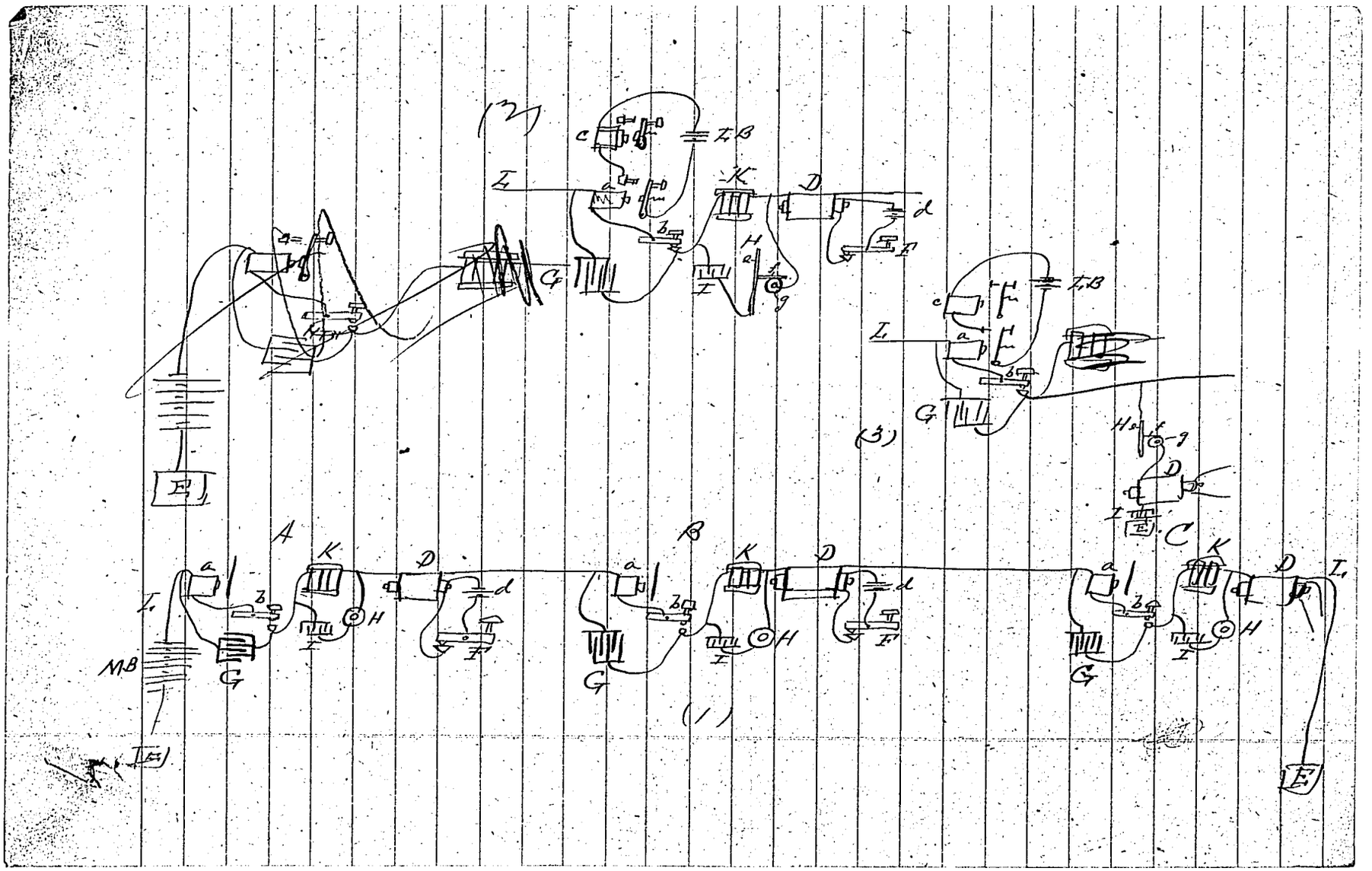
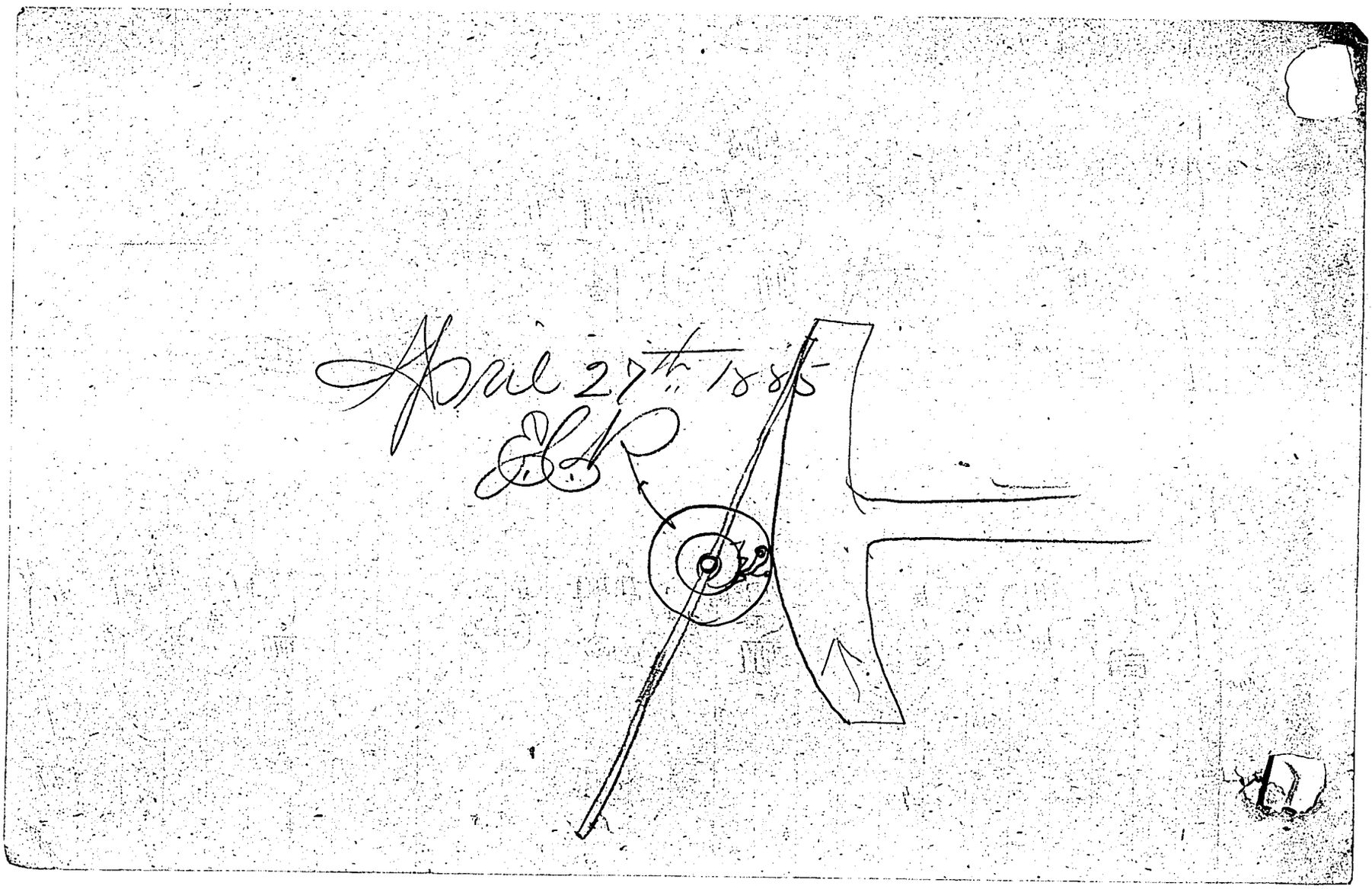
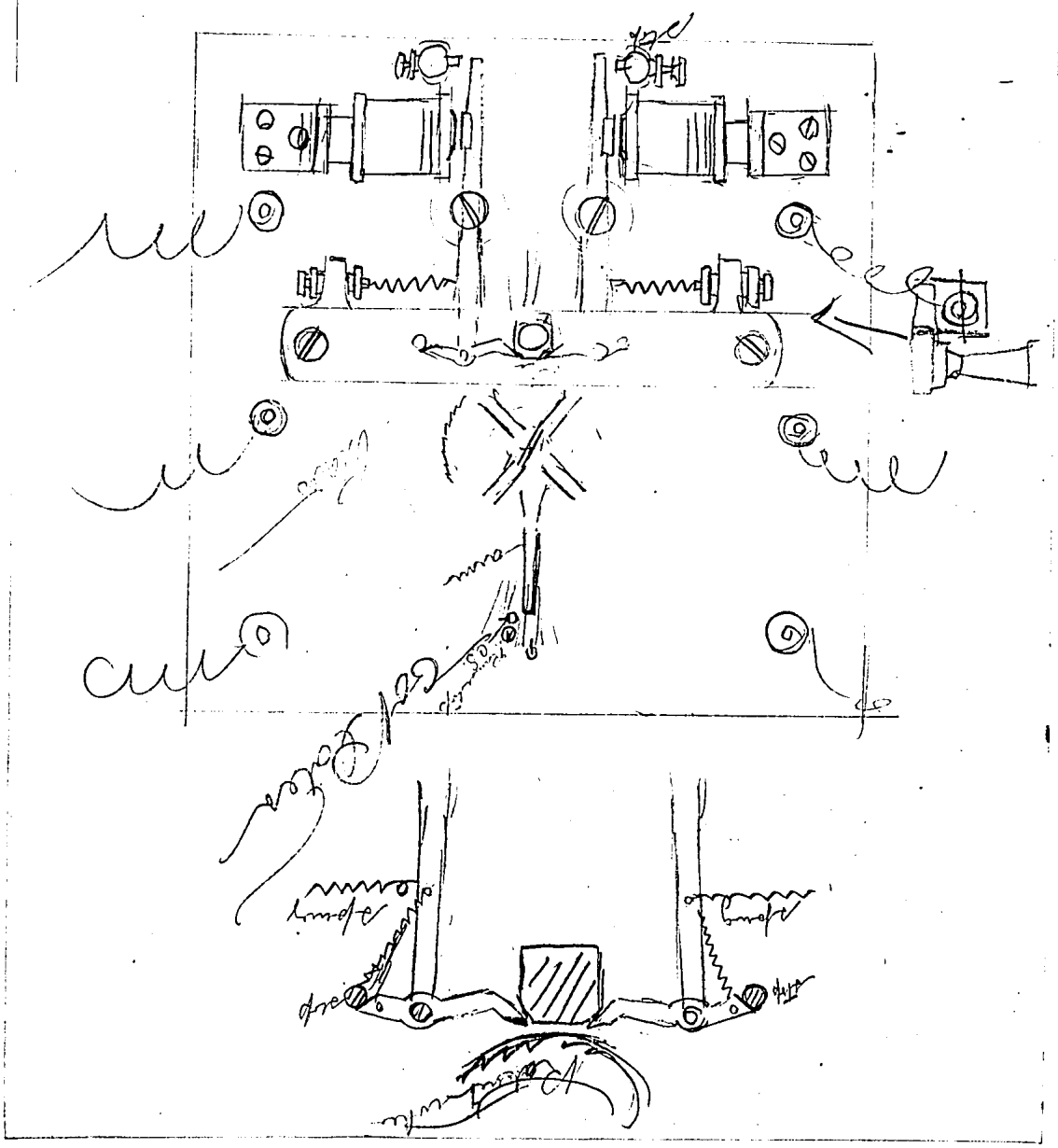


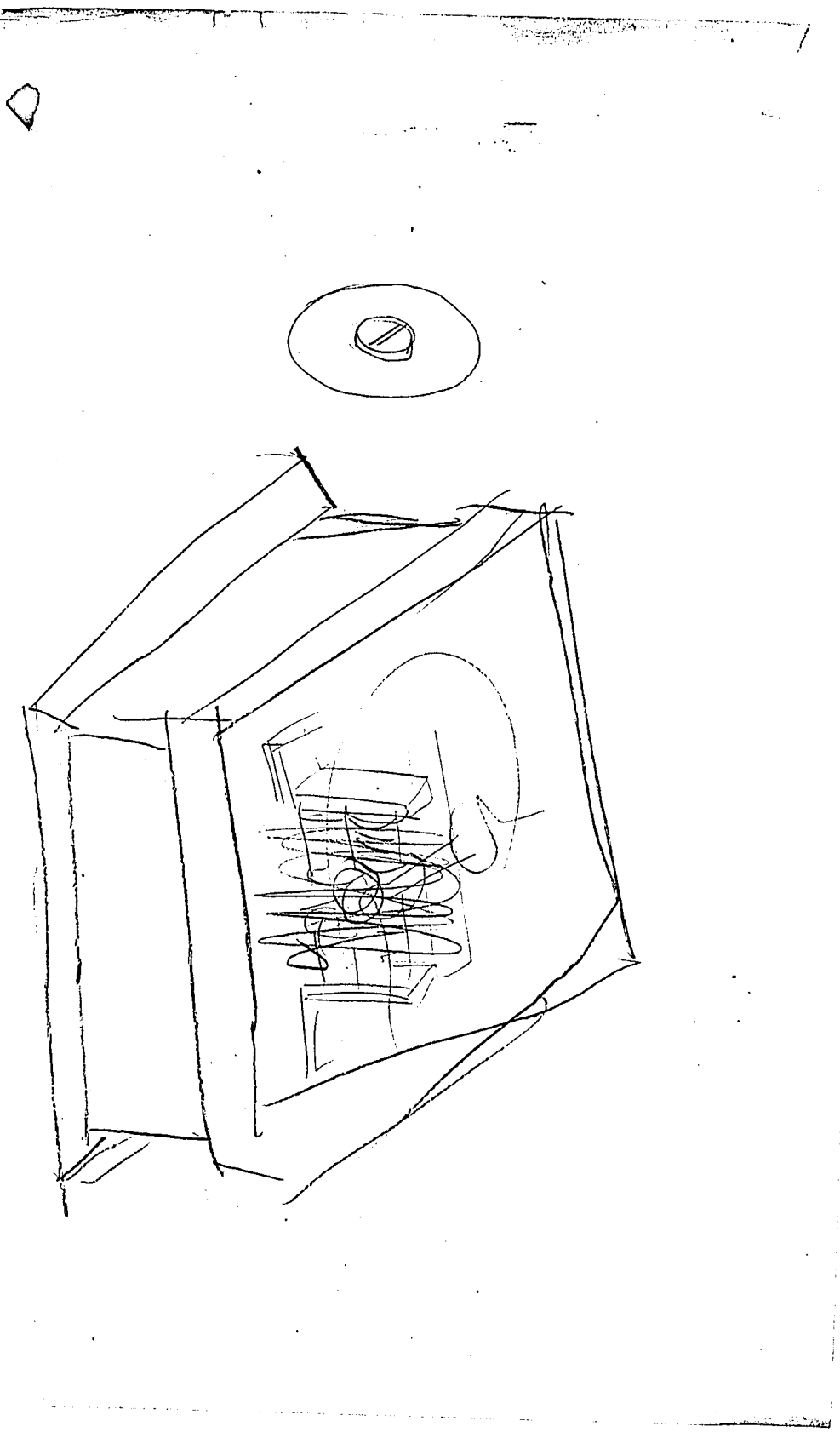
Dyer - I find that with Regular Key arranged the way it is as good + much simpler than with sounder closing on both back + front points. You know that when you open a primary of a coil the wave is twice as strong as on closing as the primary closed ckt absorbs the induction. Hence on closing Key Primary open loud sound to heard in telephone (represented by short strokes) and opening Key primary closed no or else a faint sound is heard in telephone represented by long strokes - The first method will necessitate of each pair of sounder


(2)
c
ZB
L
K
D
d
a
b
H
G
F
I
(3)
C
(1)
A
B
MB
E


April 27th 1885

April 1885





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DESIGNS AND ESTIMATES FURNISHED ON APPLICATION.
The Most Complete Facilities for all kinds of Electrical Work.
292, 294, 296 AND 298 AVENUE B,

New York April 29 1885

Dick -

I send you diagram for another patent its on the lines of the Quadruplex one message is sent by reversing the Current the other by increasing and decreasing Current. To use this principle on way wire I strick a little thing - say ~~X X~~ no reverse men are working a Keys X X all along the line are open I have no Battery from this apparatus - on the line there is Constantly Connected 0 any 16 cells. M. ½ of these may be at one Terminal + ½ at other or all together anywhere on line, this Current is used to signal on Common relay by increase + decrease by means of Key + Reverser The Battery S S' is exactly twice as many cells as M but always thrown to line in the opposite direction to M Hence of the 32 cells 16 neutralize the 16 of the main Battery put 16 on line but in opposite direction thus giving a zero as working polarized relay but not Effecting the Common relay as there is always the same ~~—~~ amount of Current - You know that in the Quad so in all cases the Common relay at the moment of reversal loses its magnetism

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(2)

for an instant and then causes the relay lever to leave its front point for an instant thus multitaking signal [redacted] it is very quick but still it multitake to obviate this the Quadruplex The back point is used to close the Sounder here at the moment of reversal the lever jumps back nearly striking the back point & does frequently strike & give a false sound. To reduce this defect to the minimum I have struck very good thing I place a large magnet in connection with the regular magnet & shunt the Cutter with it & by placing a Condenser of large Capacity in Circuit with it The Resistance of this magnet is 2 or 3000 ohms or more while the regular magnet is only ordinary Relay resistance 150 ohms at the moment of inversal a powerful waves due to the discharge & recharge of the Condenser takes place and this wave has its greatest power at the Exact moment the ordinary magnet has no magnetism this wave charges the big mag n & holds it for

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3

an instant - this wave is momentary. Then you see at the moment when the regular magnet has no magnetism it has which ceases when the common magnet has -

Claim this -
also number of stations on one line.
provided with Common & polarized -

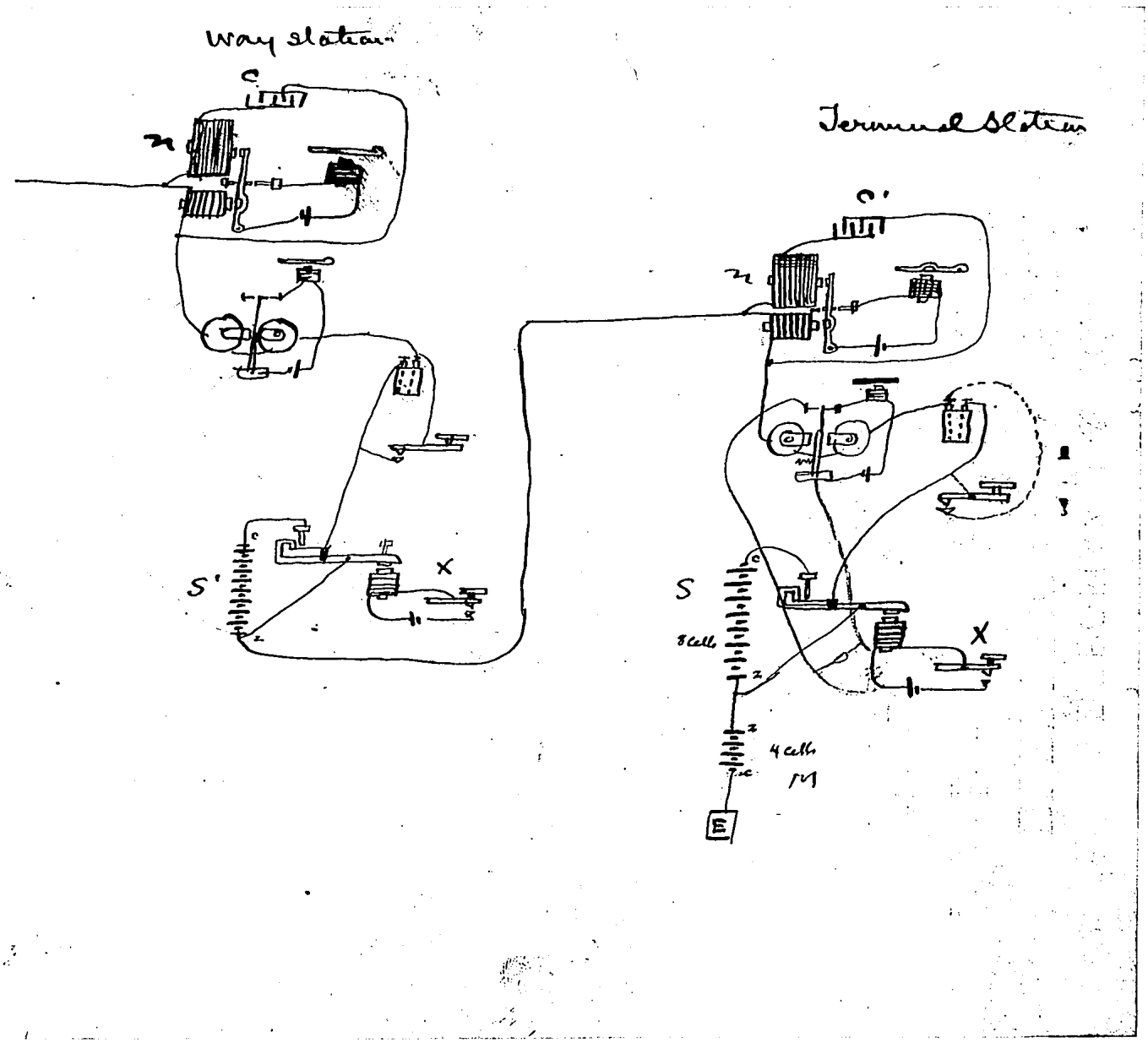
Combination throwing in out Rec to work Common -

The manner of removing the drop shutter after the Current on line at a number of stations

This method of removing for use in Telegraphy.

This way station system is entirely original & you at get some very Broad claims -

The only defect is that while the Common relay Opens Can interrupt the polarized men must only close or interrupt while the sender is open this is no objection as they can manipulate every 10 words or so — Edison


Way station
C
R
S'
X
Terminal Station
C'
R
S
8 cells
X
4 cells
E

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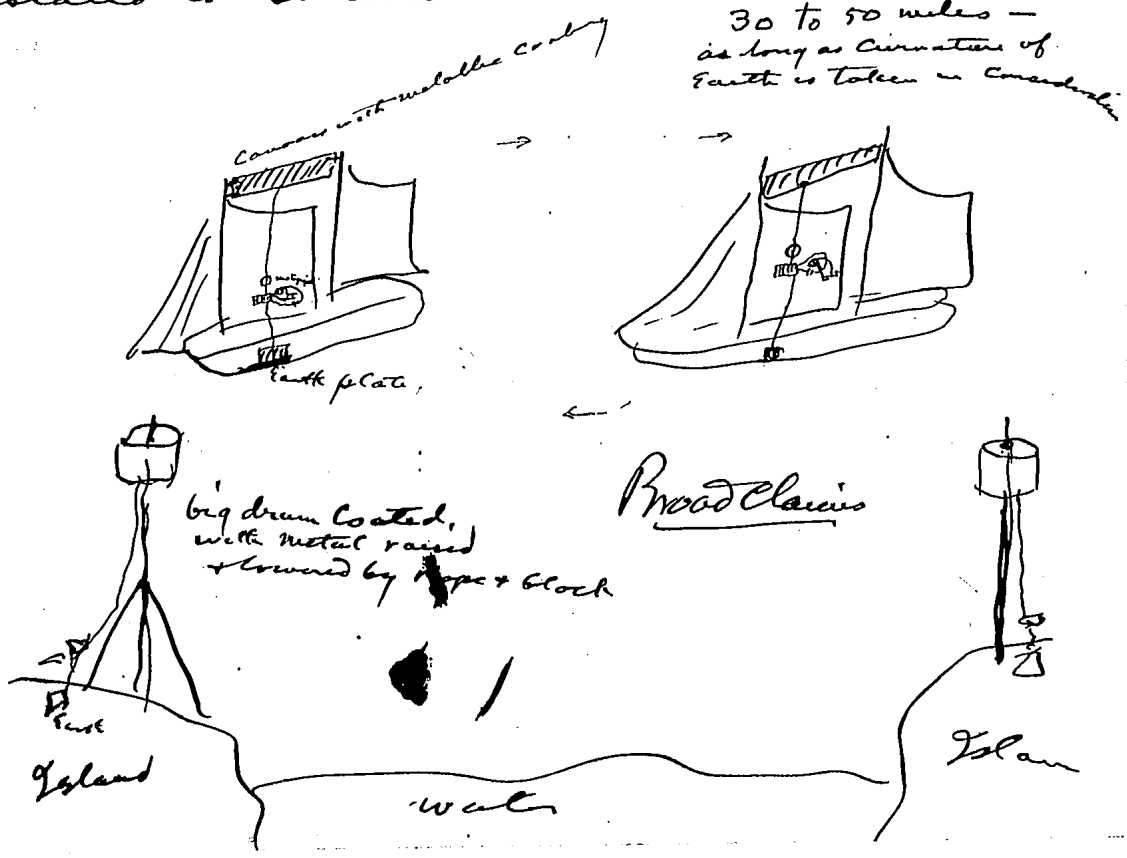
292, 294, 296 AND 298 AVENUE B,

New York, May 6 1884 For 188

Dyer -

Take out patent for new method Telegraphing without wires especially available for communicating between Ships at sea across Rivers from Island to Island.



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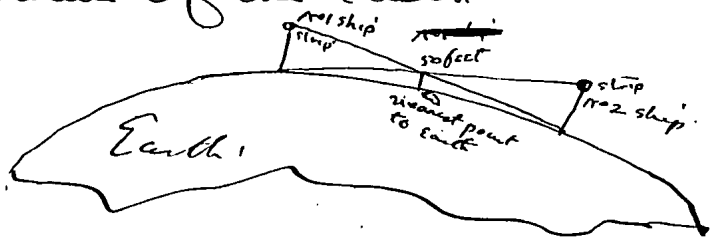
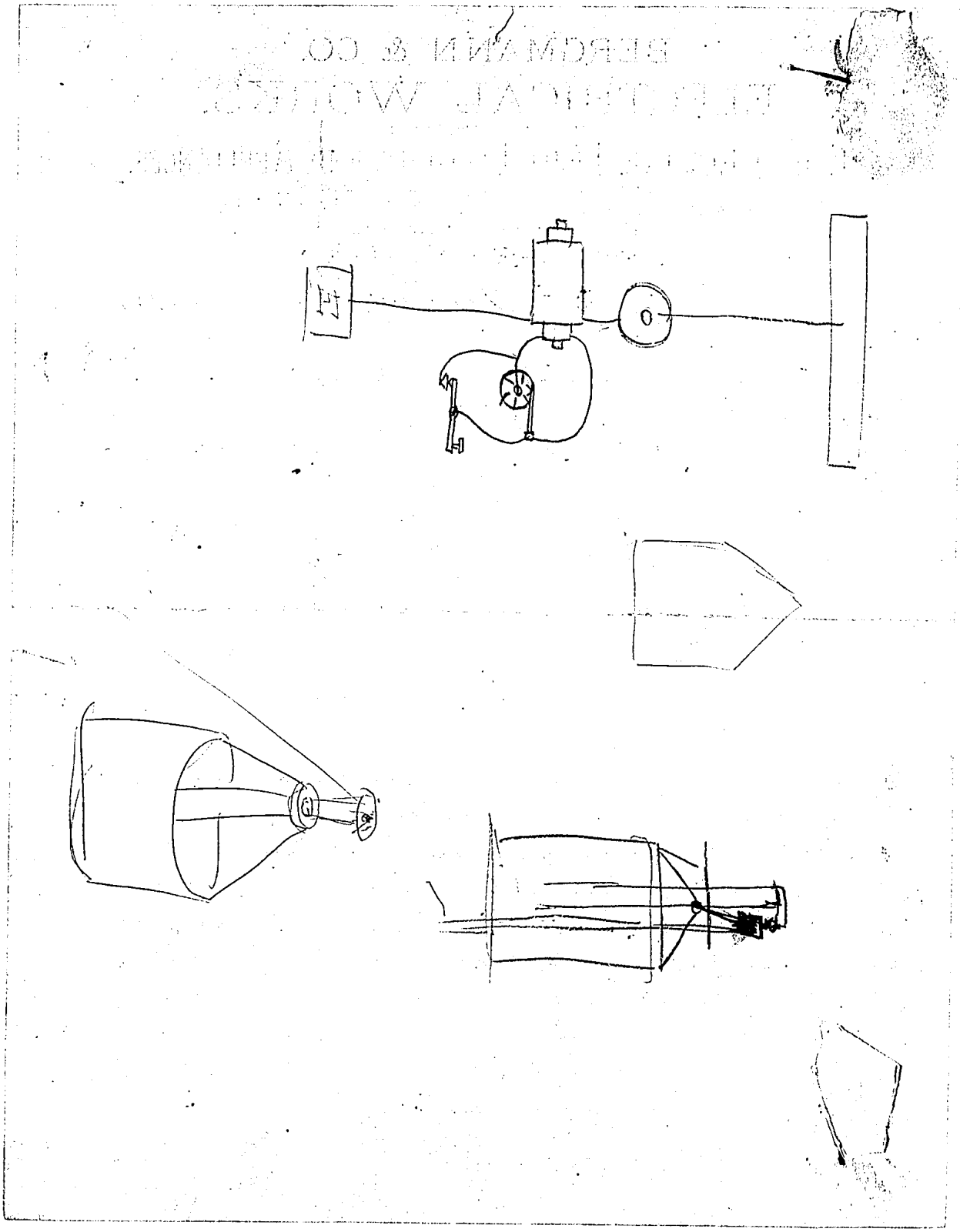
*New York,* 188

You can telegh from ships 24 miles apart when metallized strip is 100 feet from sea level & then be 50 feet over the line of Curvature of the Earth




Suppose two ships were 24 miles apart they could telegh & if there was another ship 24 miles further the messages could be repeated from the 1st to last ship 48 miles apart & so on if on the lines between Liverpool & New York Communications cld be exchanged & repeated from ship to ship 1/2 way across ocean — at sea its very quiet & one only has to contend with the absorption due to the sea, & not to trees houses, hills etc.

E



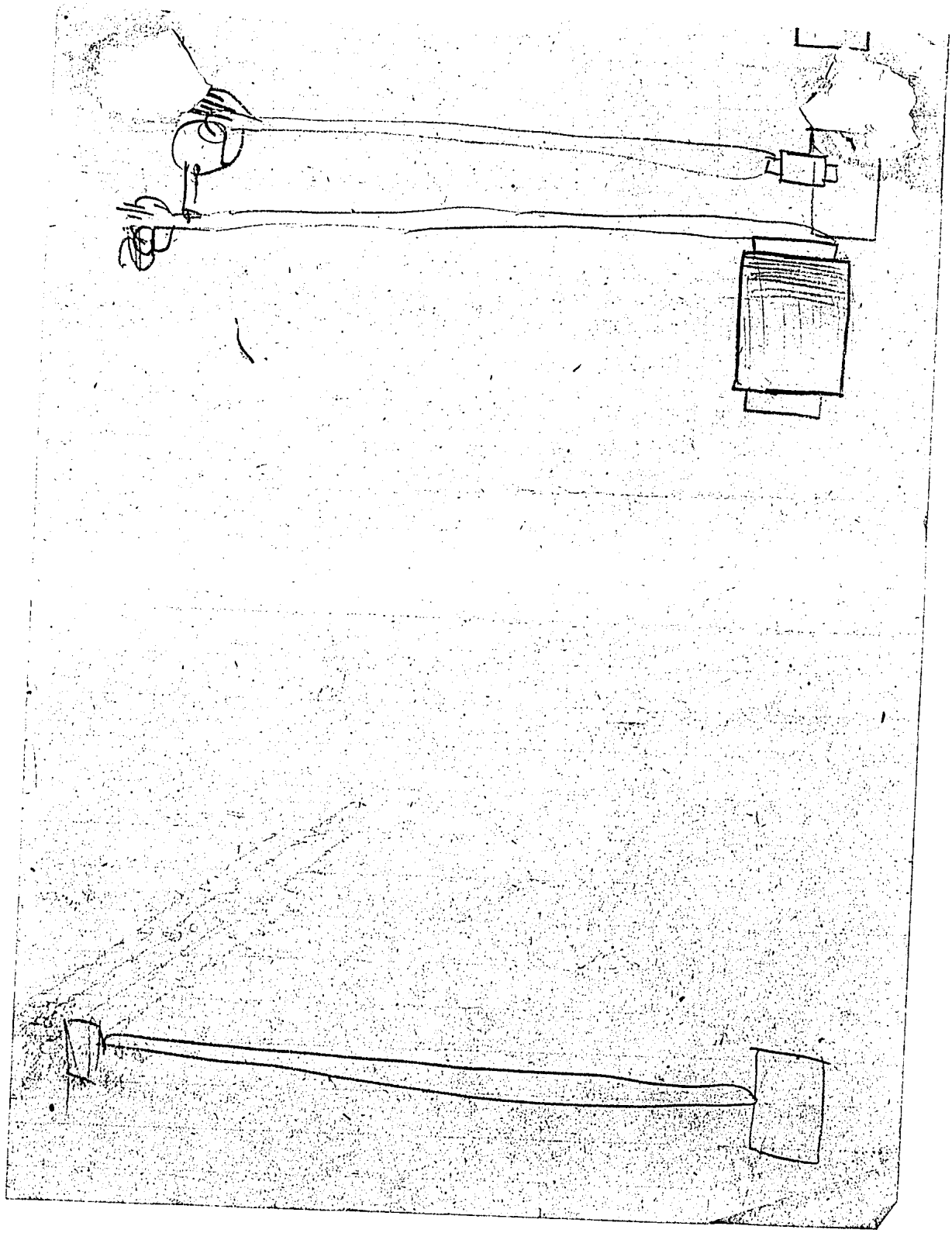
Damage measured 12 ft 6 in

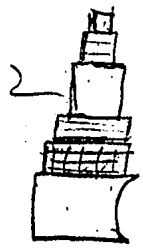


54 ft

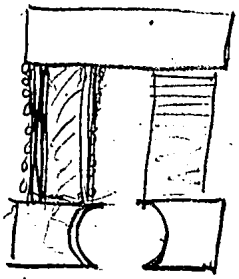
54 ft

Look at Damage measure
Answer for M. Brannon
on railroad case
Gilman & Hanover










Drawing Made
May 11th 1955

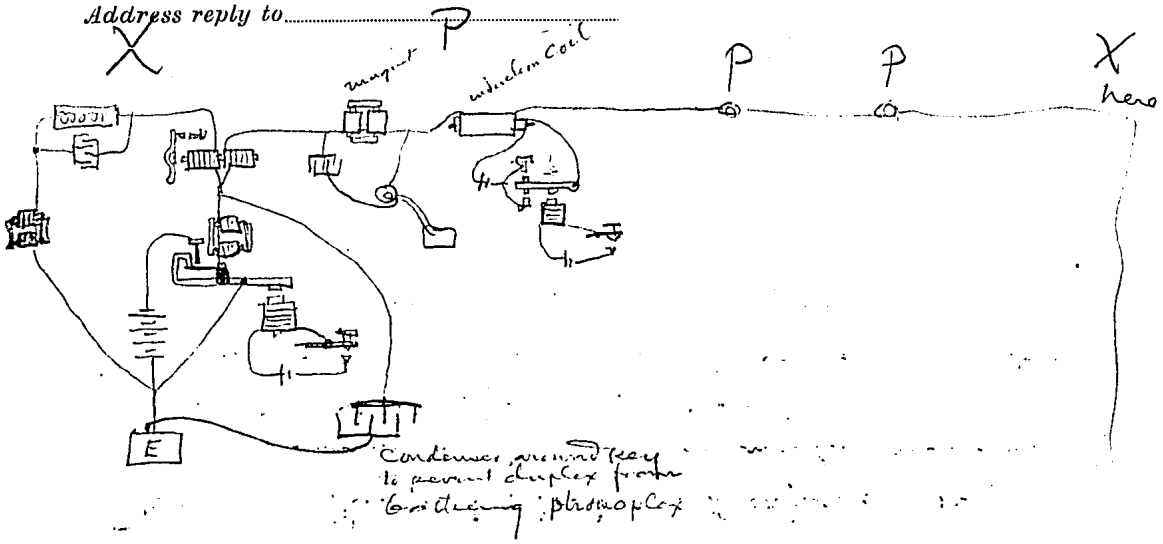
Form M.

THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,
NEW YORK.

W. D. RICH,
SUP'T OF CONSTRUCTION.

..... 188

*Address reply to* .....

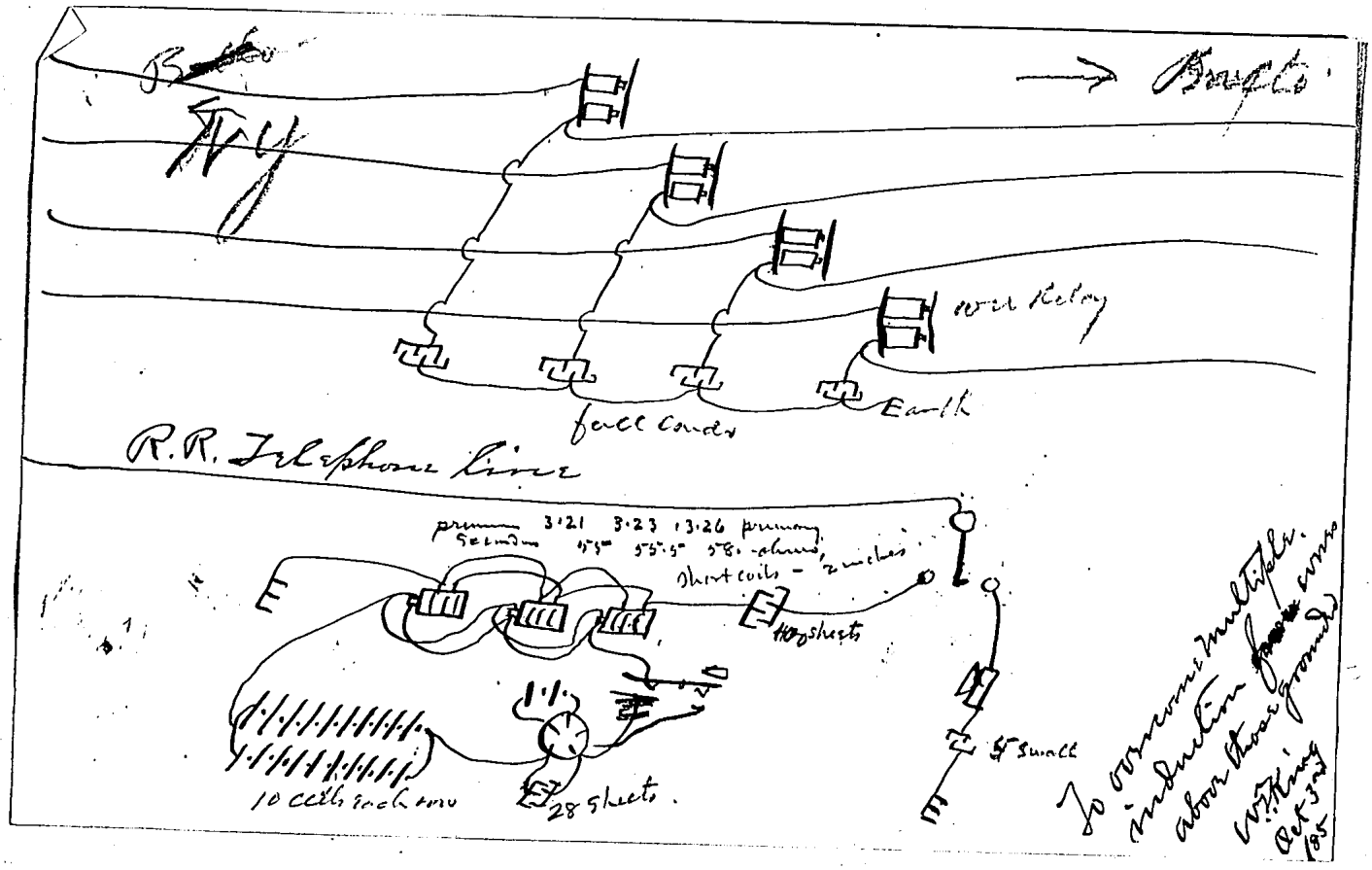


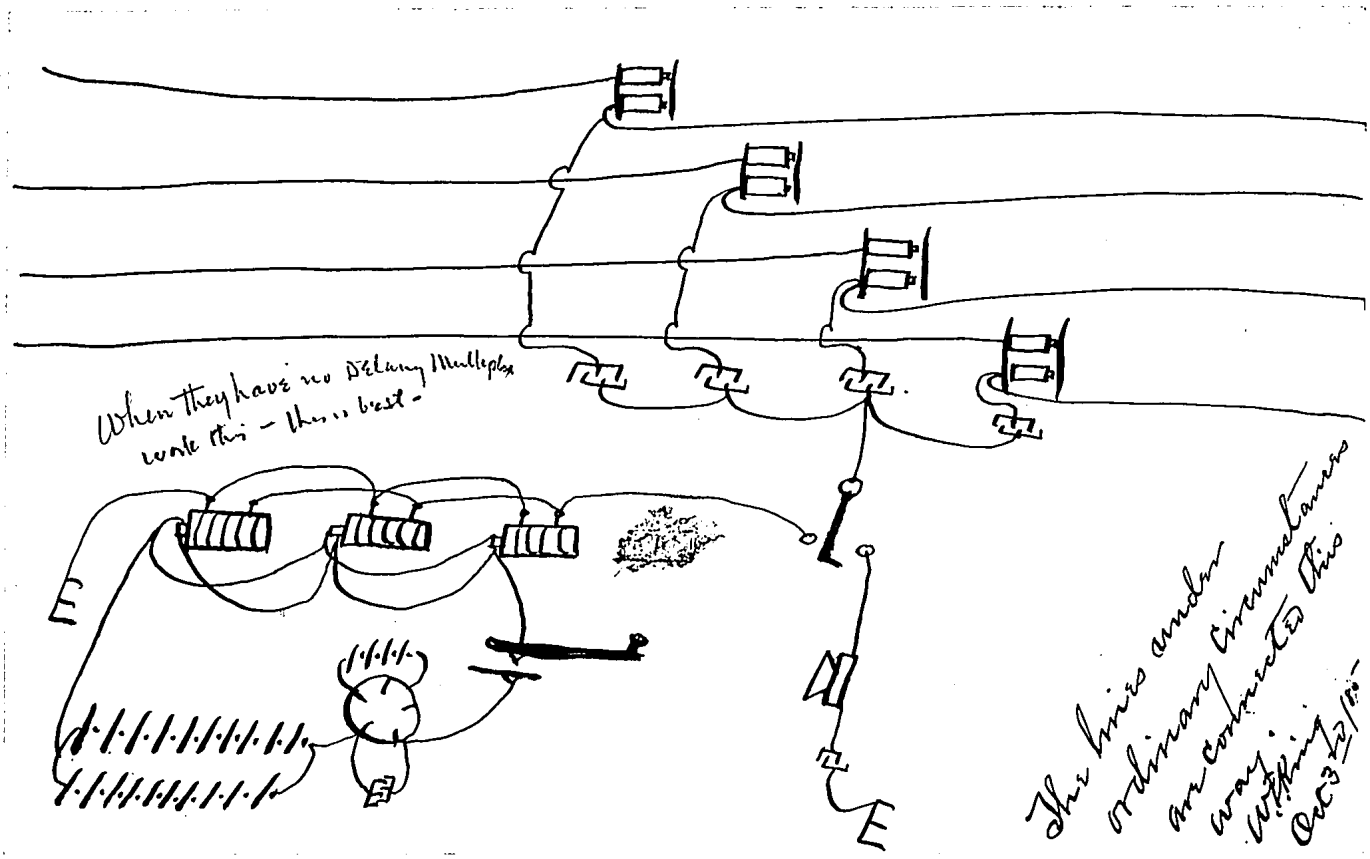

Dyer - This is to take a Duplex wire and at intermediate + terminal add several phonoplex apparatus so we can make a way wire out of a Duplex patent this in US + England

E

Germany. France —

Sep 18th 1885
EDR

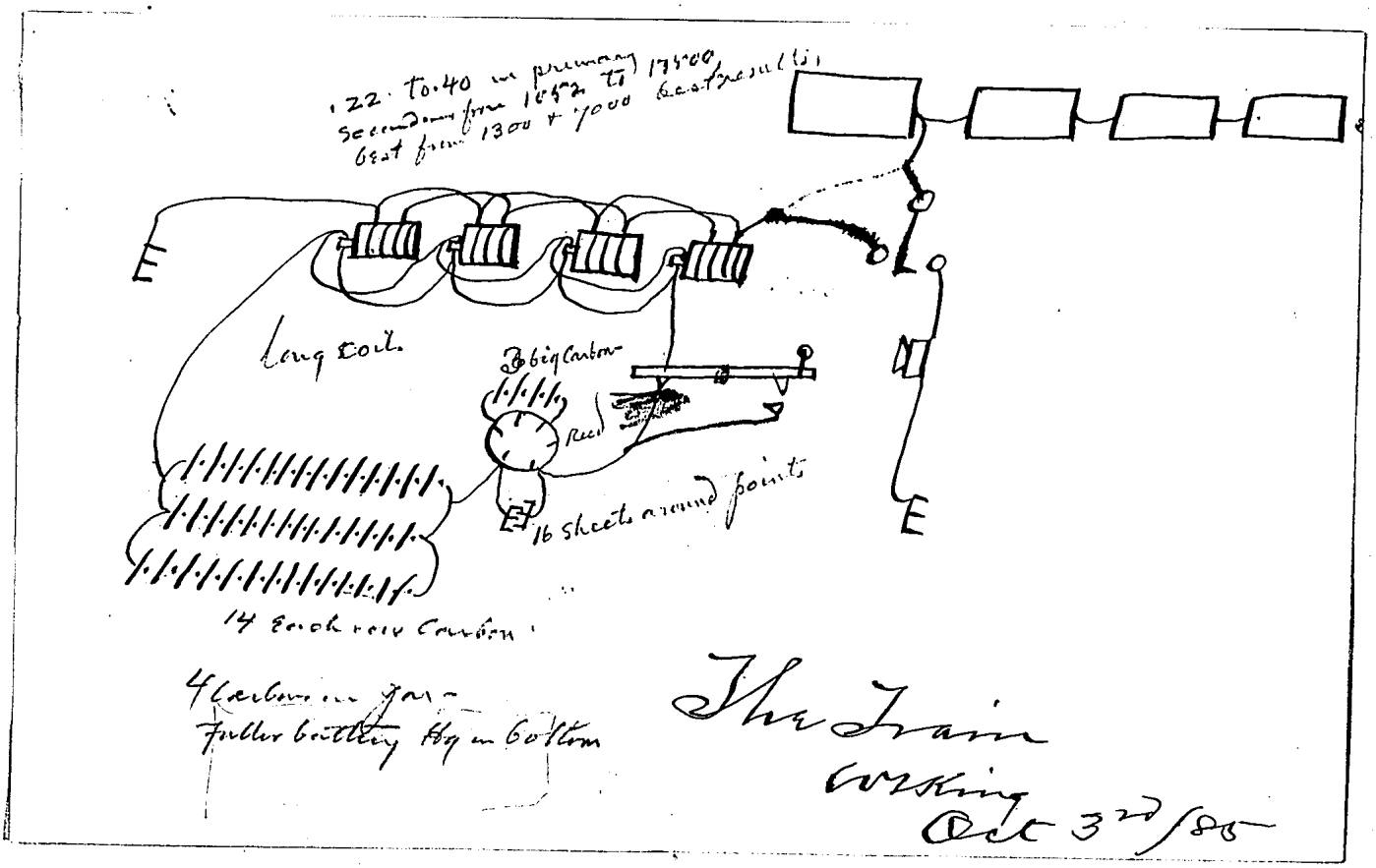

Earth
Wire Relay
Earth
R.R. Telephone Line
primary 3·21 3·23 3·26 primary
Secondary
Shunt coils - 2 inches
10 coils each row
28 sheets.
To overcome multiple induction from wires above those grounded
Wilkins
Oct 3rd
1905


When they have no Delany Multiplex
work this – this is best –
E
E
The lines under ordinary circumstances are connected this way
Wilbur
Oct 3 12/05

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, 188

I am absolutely
cured thru
E T


.22 To.40 on primary 17500
Secondary from 1652 to
Heat from 1300 to 7000 Centrigrade (?)
Long Coil.
3 big Carbon
Red
16 Sheets around points
14 Each row Carbon
4 Carbons in Jar -
Fuller bottle Hg in Bottom
The Train
working
Oct 3rd/88

Form J. J.-500-12-3-'83

THOMAS A. EDISON.
No. 65 FIFTH AVENUE.

W. D. RICH,
SUPT. OF CONSTRUCTION.

*Address reply to*.....

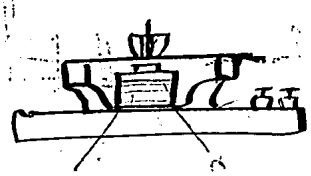
.....188

Dick —

In view of that point

I signed to you

Change the diagram this



per enclosed
diagram
+ little weights

Edison

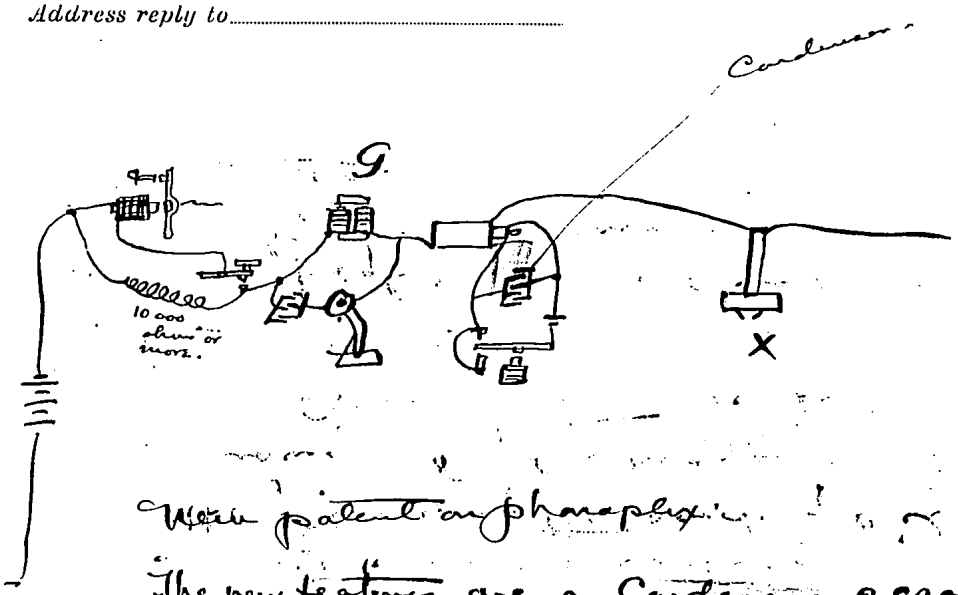
THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,
NEW YORK.

Form M.

W. D. RICH,
SUP'T OF CONSTRUCTION.

Oct 22 1883

*Address reply to*.....




Water patent on phonaplex.

The new features are a Condenser across the primary of the sending coil—
2nd using a Regular magnetic telephone X right in circuit without the magnet G—
3rd a High resistance around the Relay and Key. arranged in the way sheeun

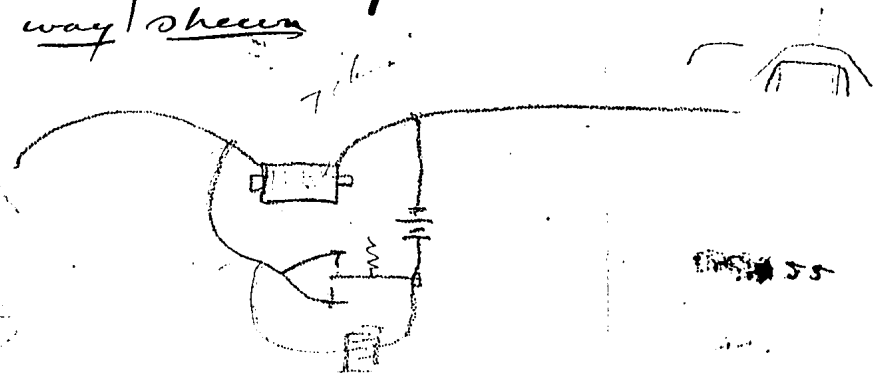
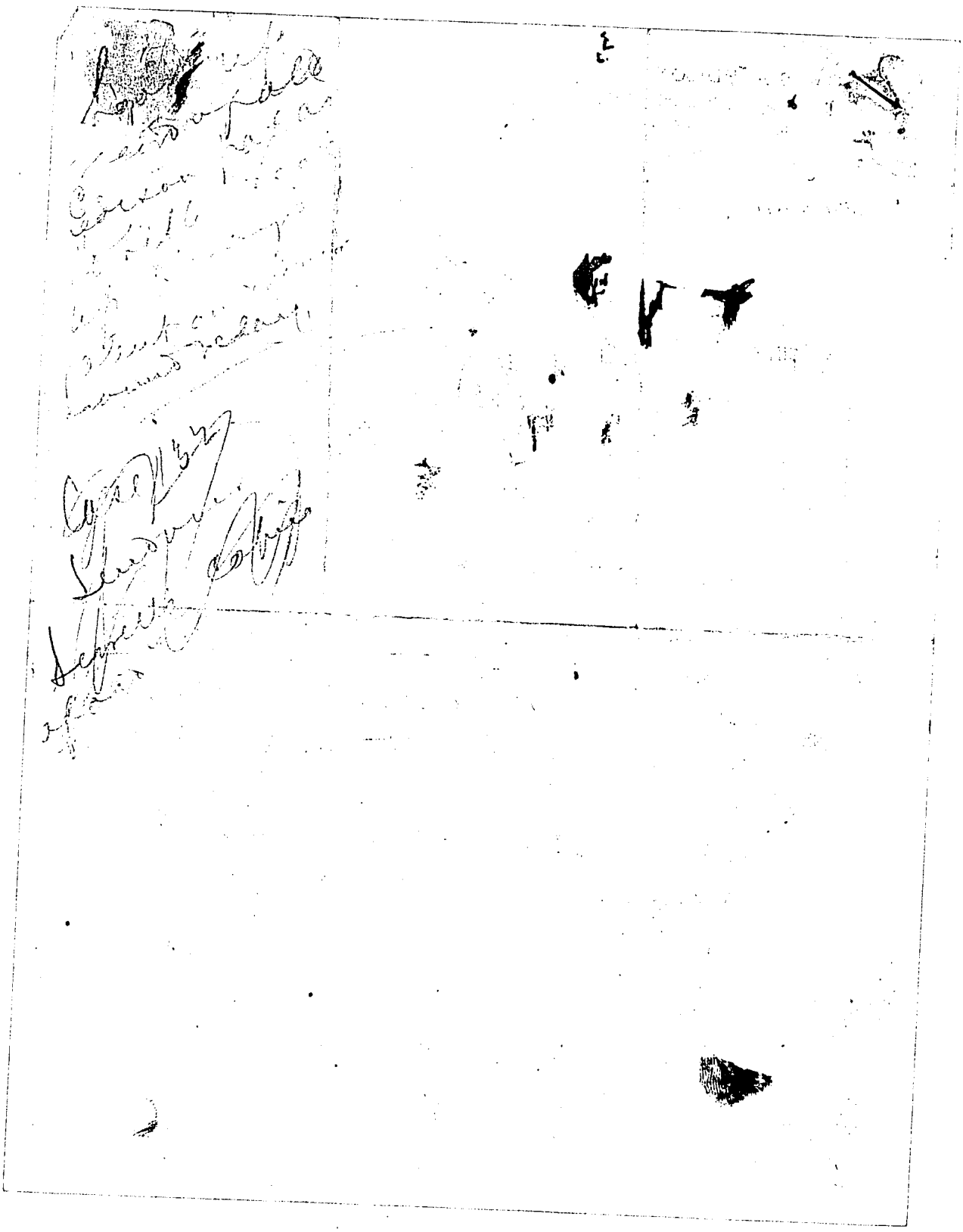


Fig 55



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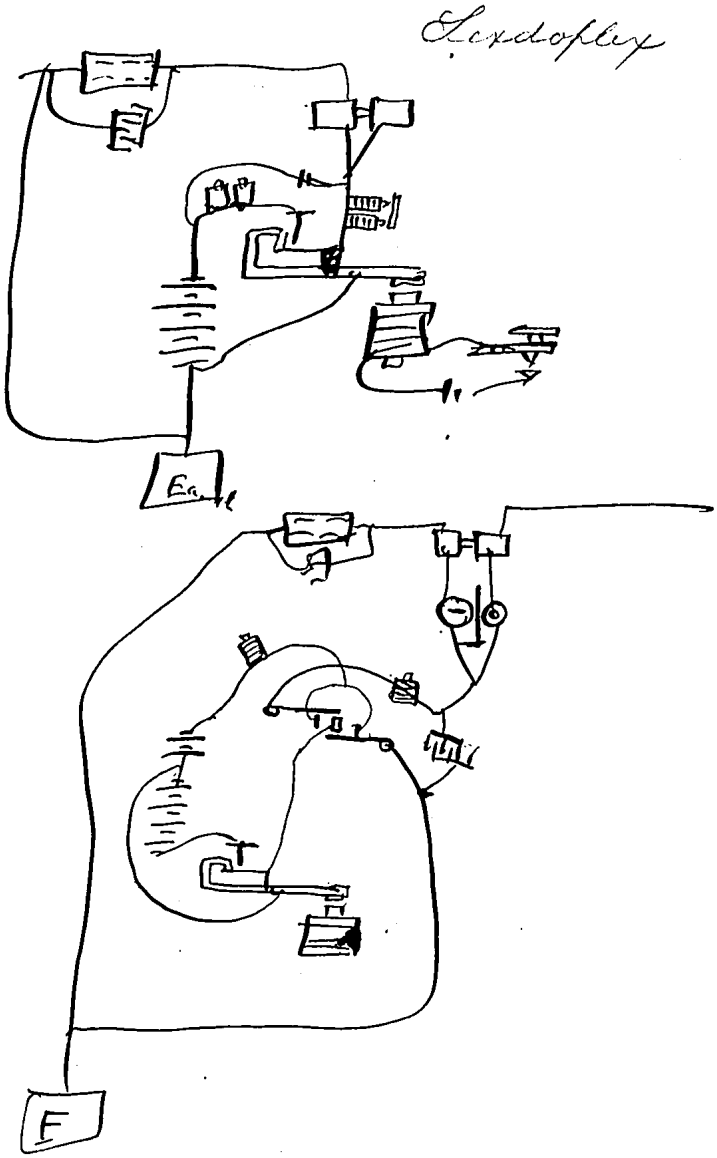
Oct 21 1885

*Address reply to*.....

John T. Hill
M. N. Forney

Lexdoplex



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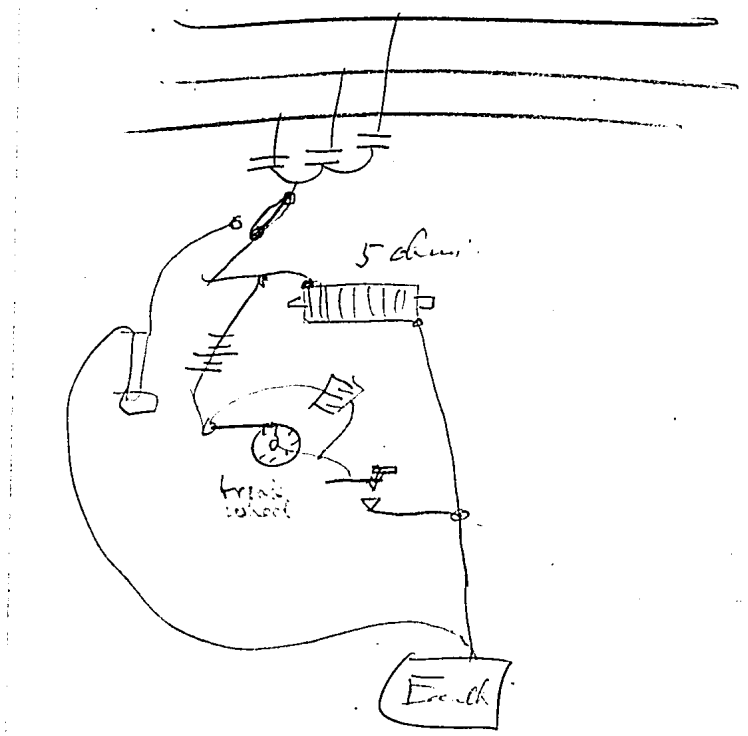
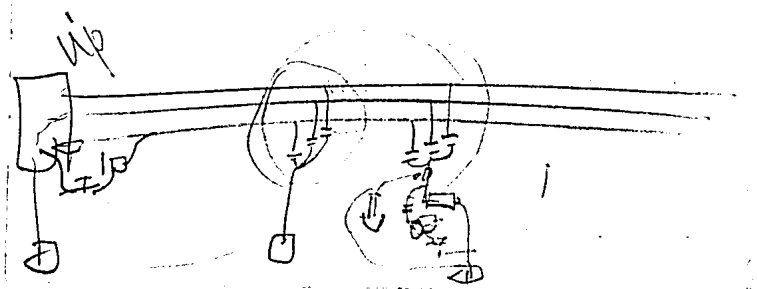
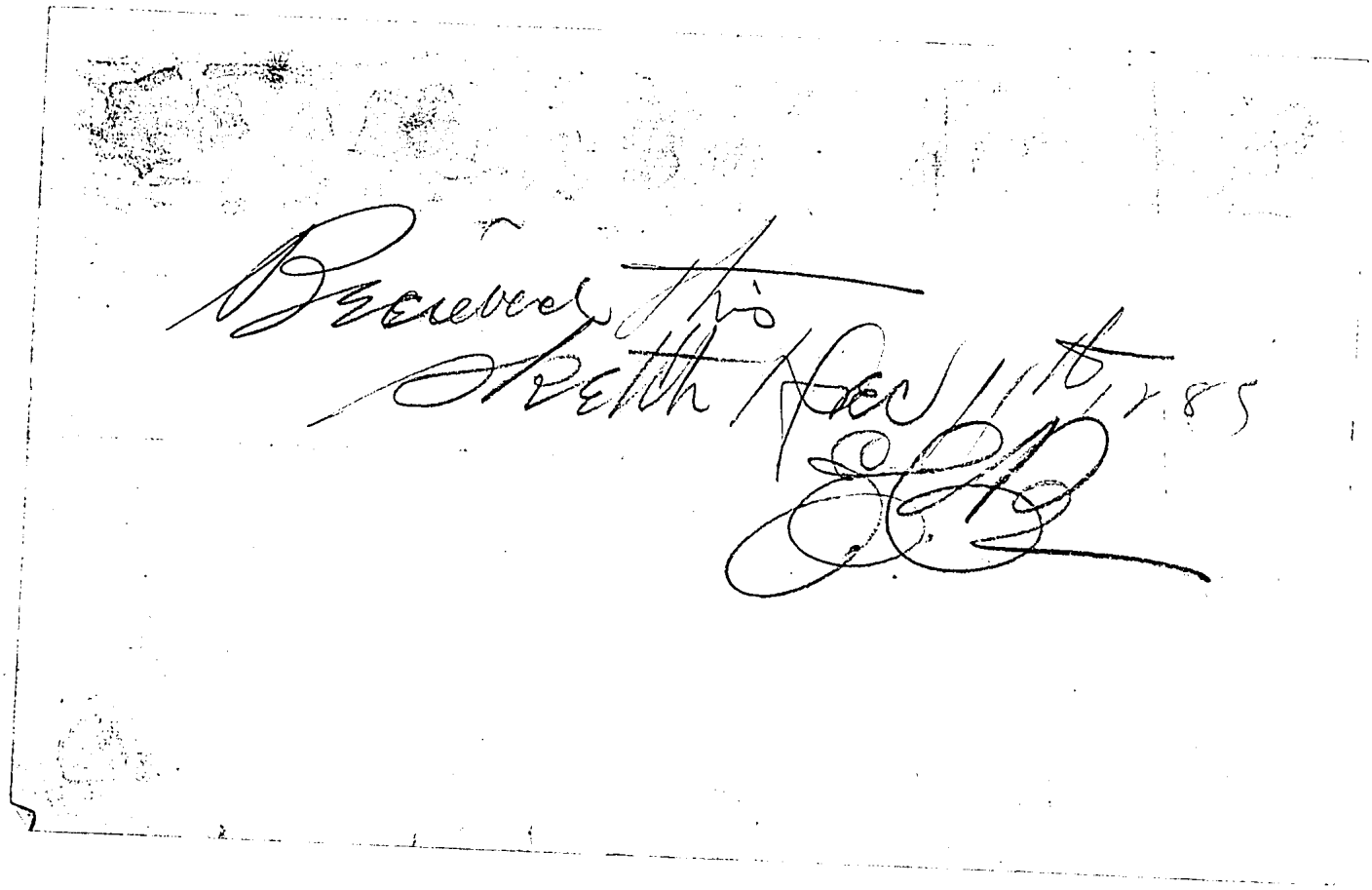
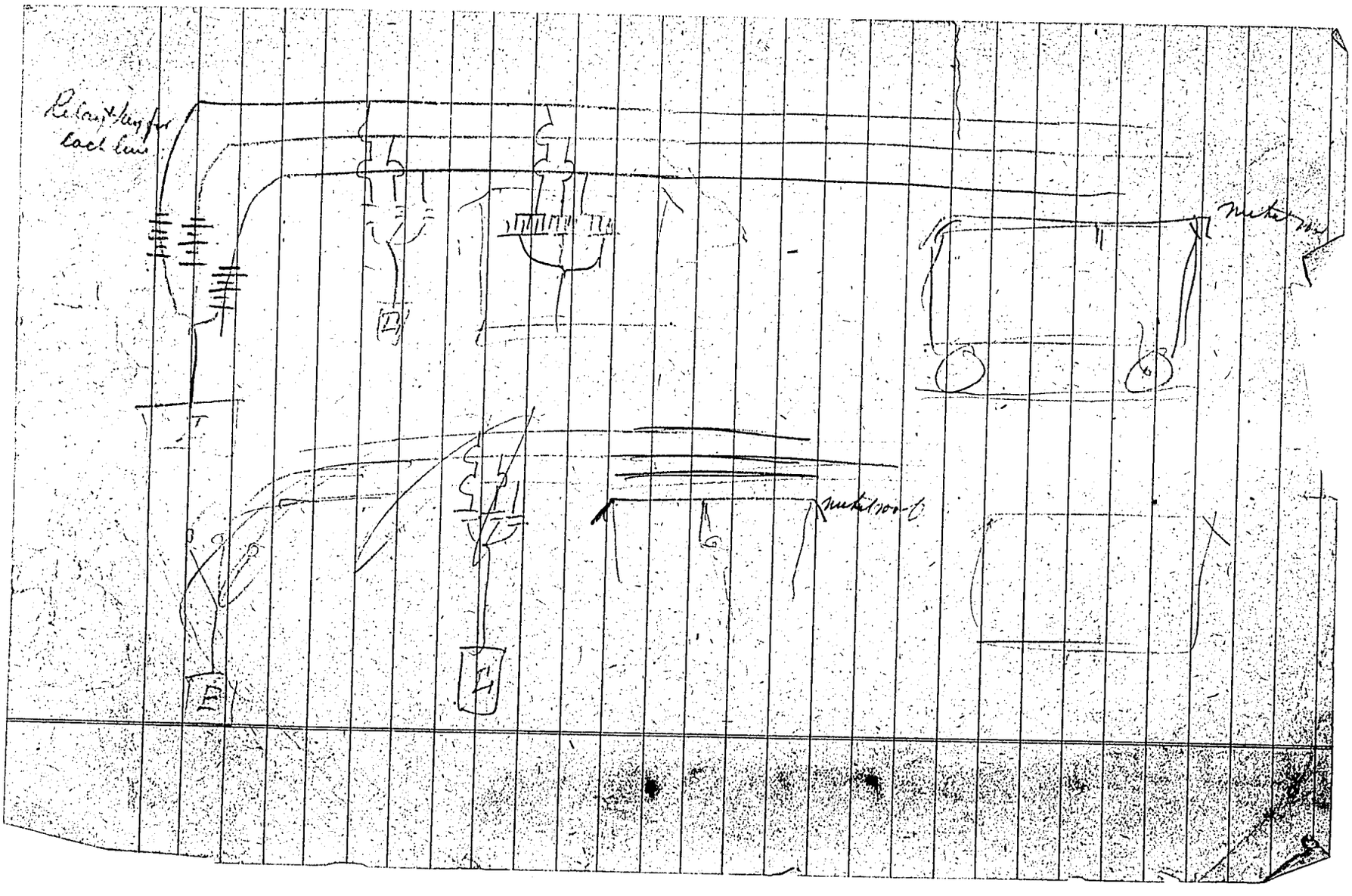
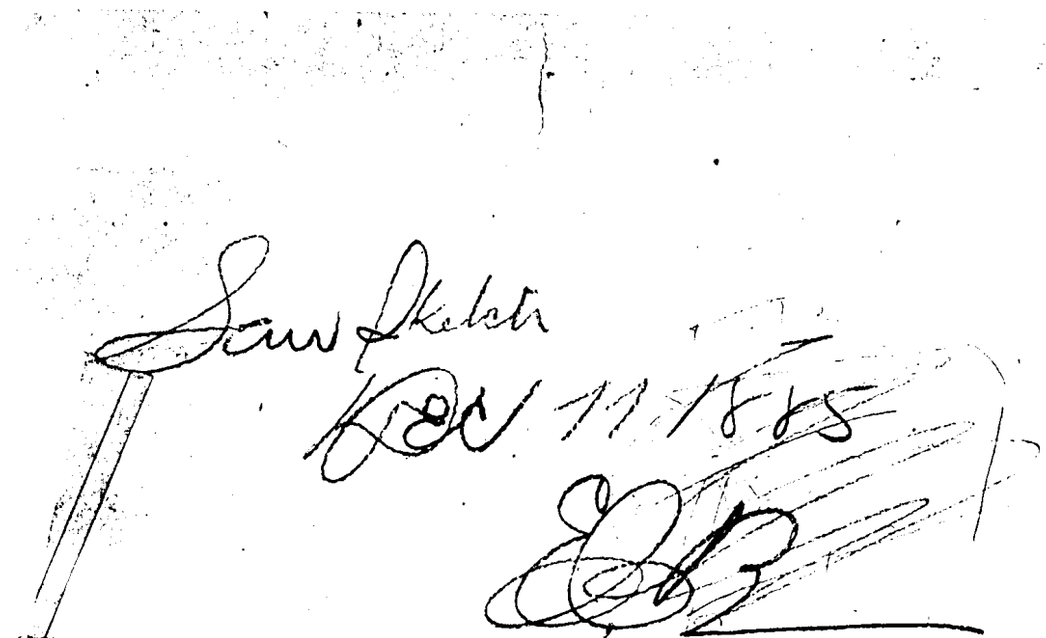
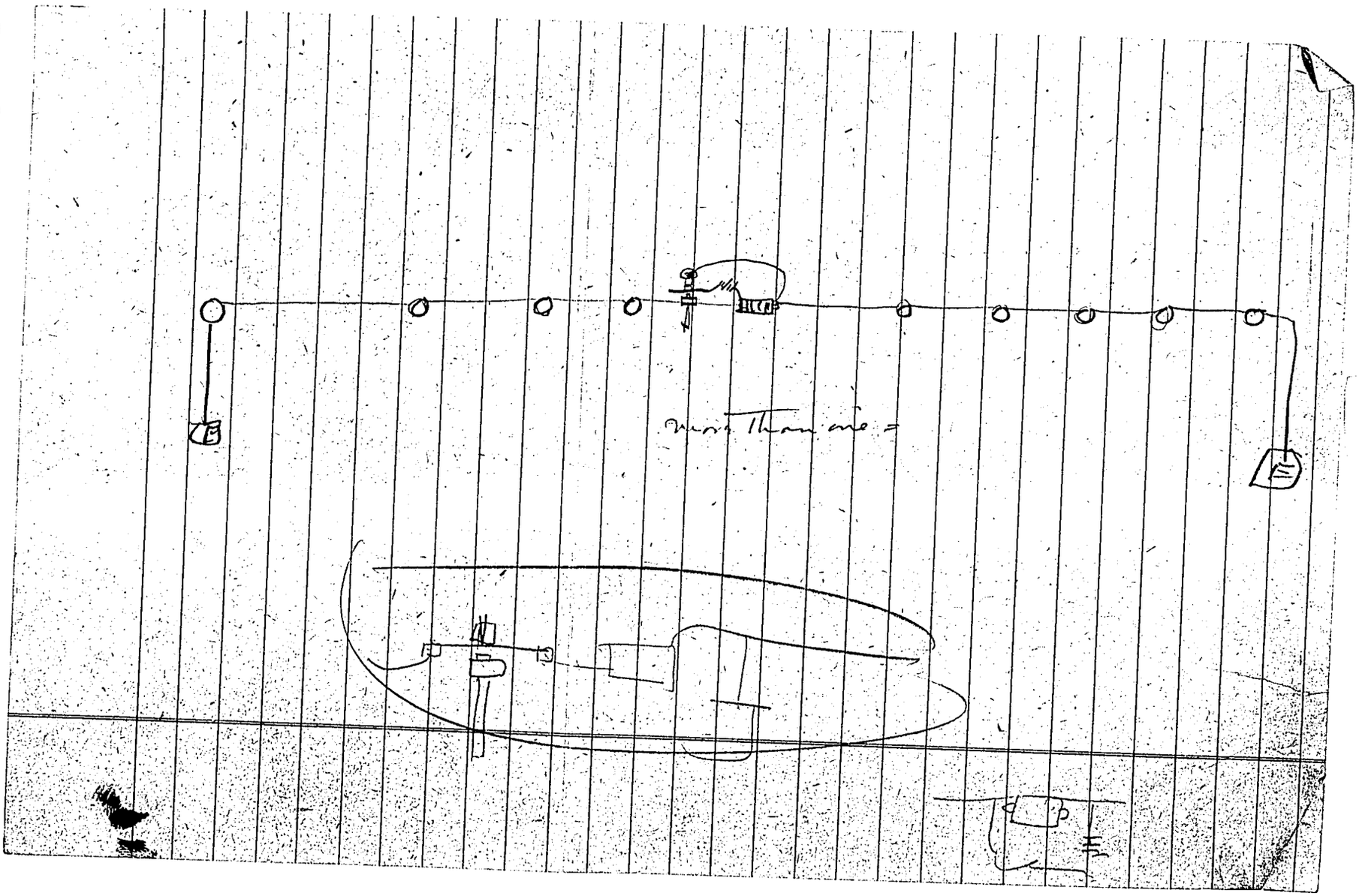


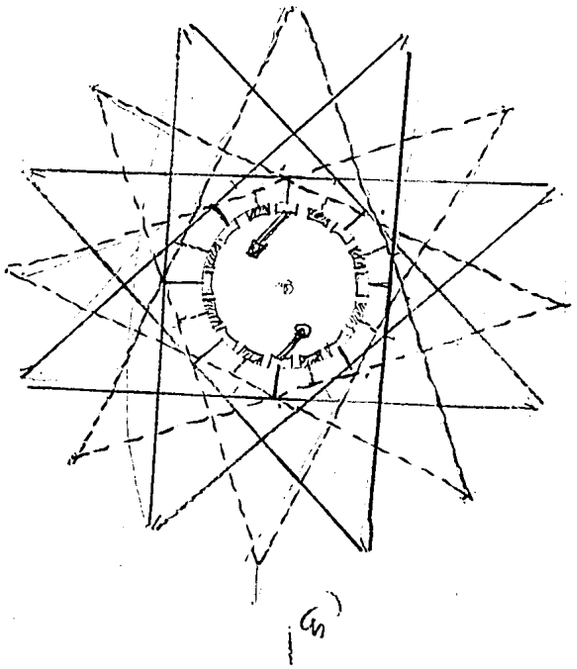








E. C. Bowland
Nov 27 10
1885



RICHARD N. DYER.

Cable Address:
"VERNERVE, NEW YORK."

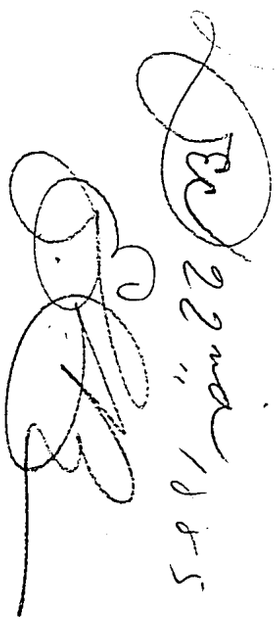
H. W. SEELY.

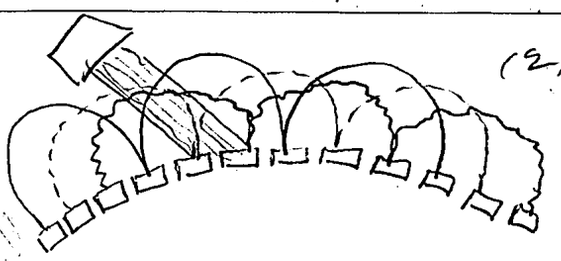
DYER & SEELY,

ATTORNEYS AT LAW AND SOLICITORS OF PATENTS,

No. 65 FIFTH AVENUE,

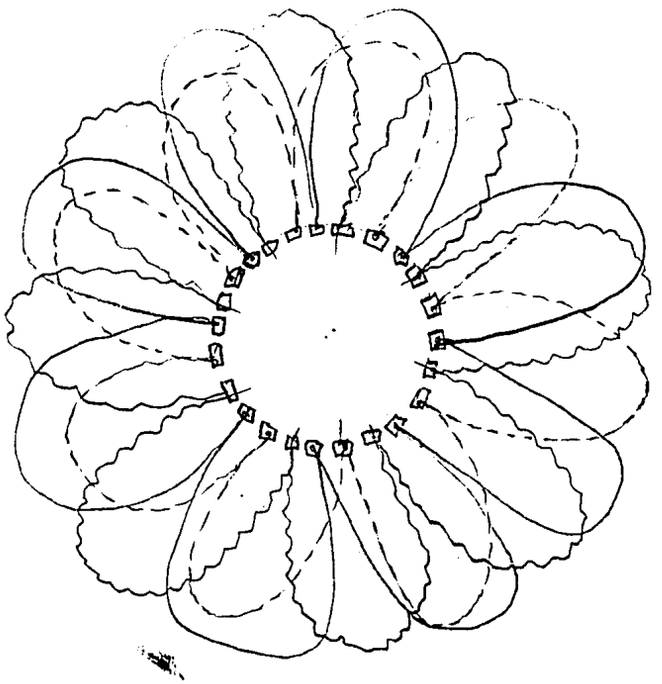
New York, ..... 188

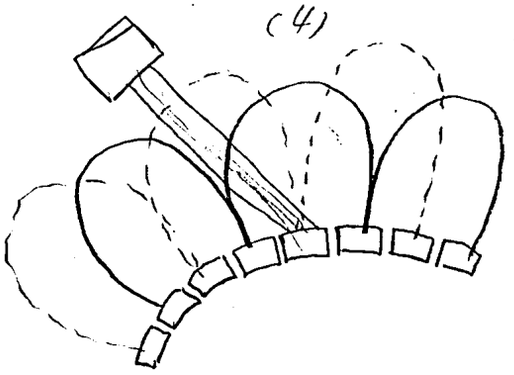




(2)

(1)





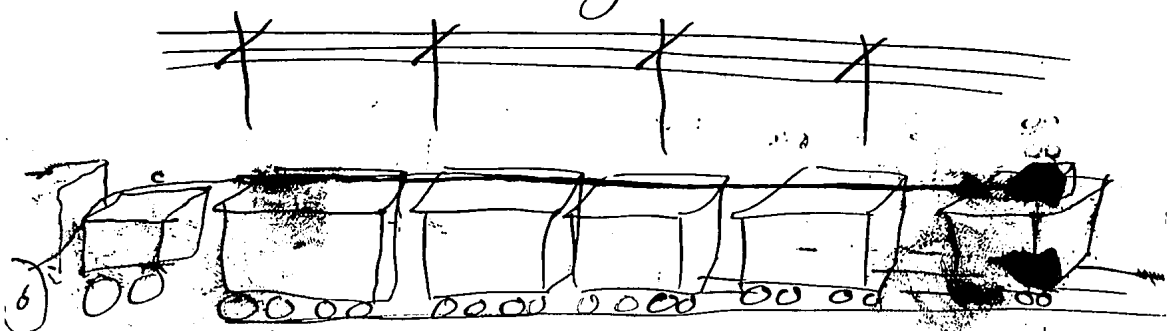
(4)

E. T. Gilliland,
Boston.

Jany 21 1886

Dear

Take out following patent.



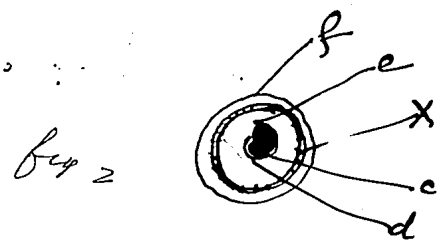



fig 2

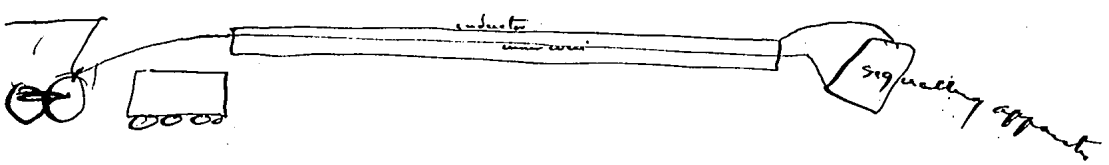
In the purpose I have a reel on which I coil a cord about 1/2 inch diameter. The cord contains either one or two conductors. There are several hundred feet of it sufficient to reach the whole length of the largest

E. T. Gilliland,
Boston.

freight train, it is to be used as one plate of the Condenser on the RR Lehigh which the RR Lehigh uses for the other plate,

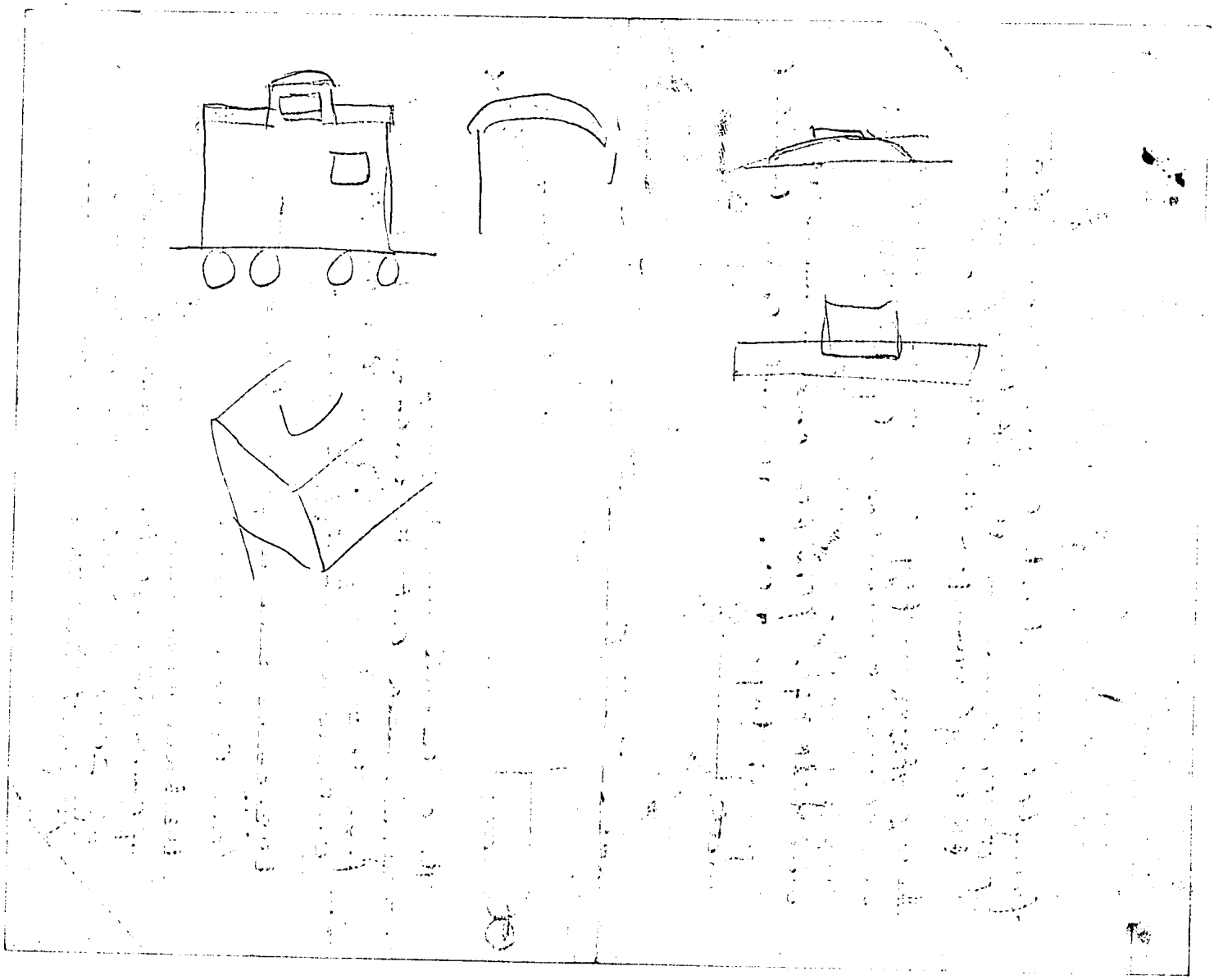
The cord shown in fig 2 consists 1st of the small wire c surrounded by d - then e is rope; over this is wound spirally copper wire making a flexible cord - over this again is tape & then the whole is braided with hemp -

Loco




The Cutters wire runs to Locomotive to get a good ground ~~on~~ but the Caboose wheels may be fixed to make a good ground & thus the Cutter wire need not be used -

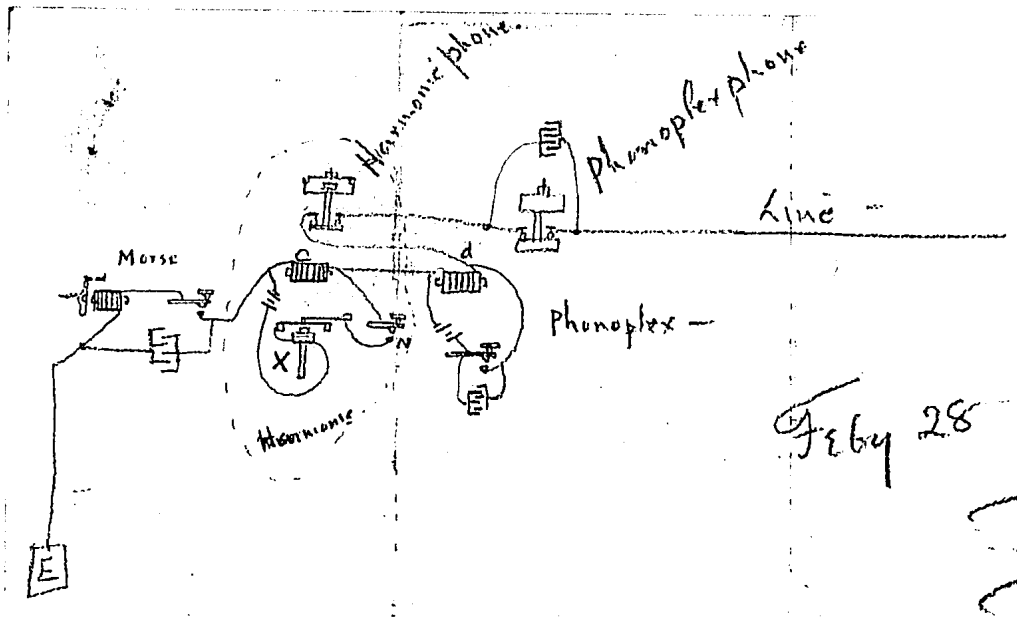
We could use a flat band ——
Lead Covered wire Etc
We have ascertained that it is length of Conductor is what is wanted ~~instead~~ of 2000 feet of suffers on two or 3 cars. 7½-feet are 30 or 40 is better, greater



length parallell with the telegraph wires is the ticket = we can possibly use a ~~telegraph~~ telephone instead of morse on long freight trains I think you might mention this,

getting claim — take patent in my name — Edison

PS Chng. to RR Telg & Tel Co




Feby 28 1886

Thos

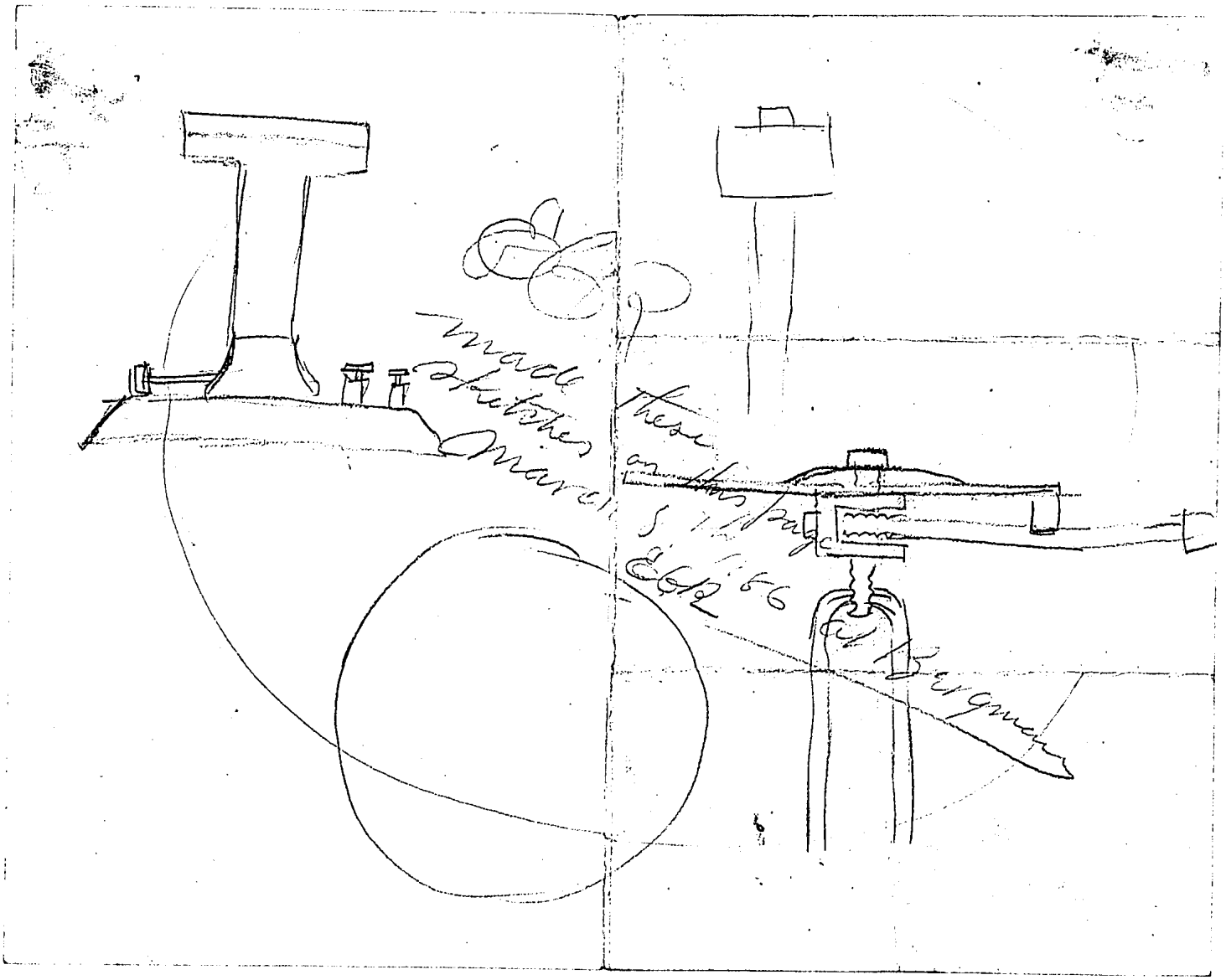
(Triphonoplex)

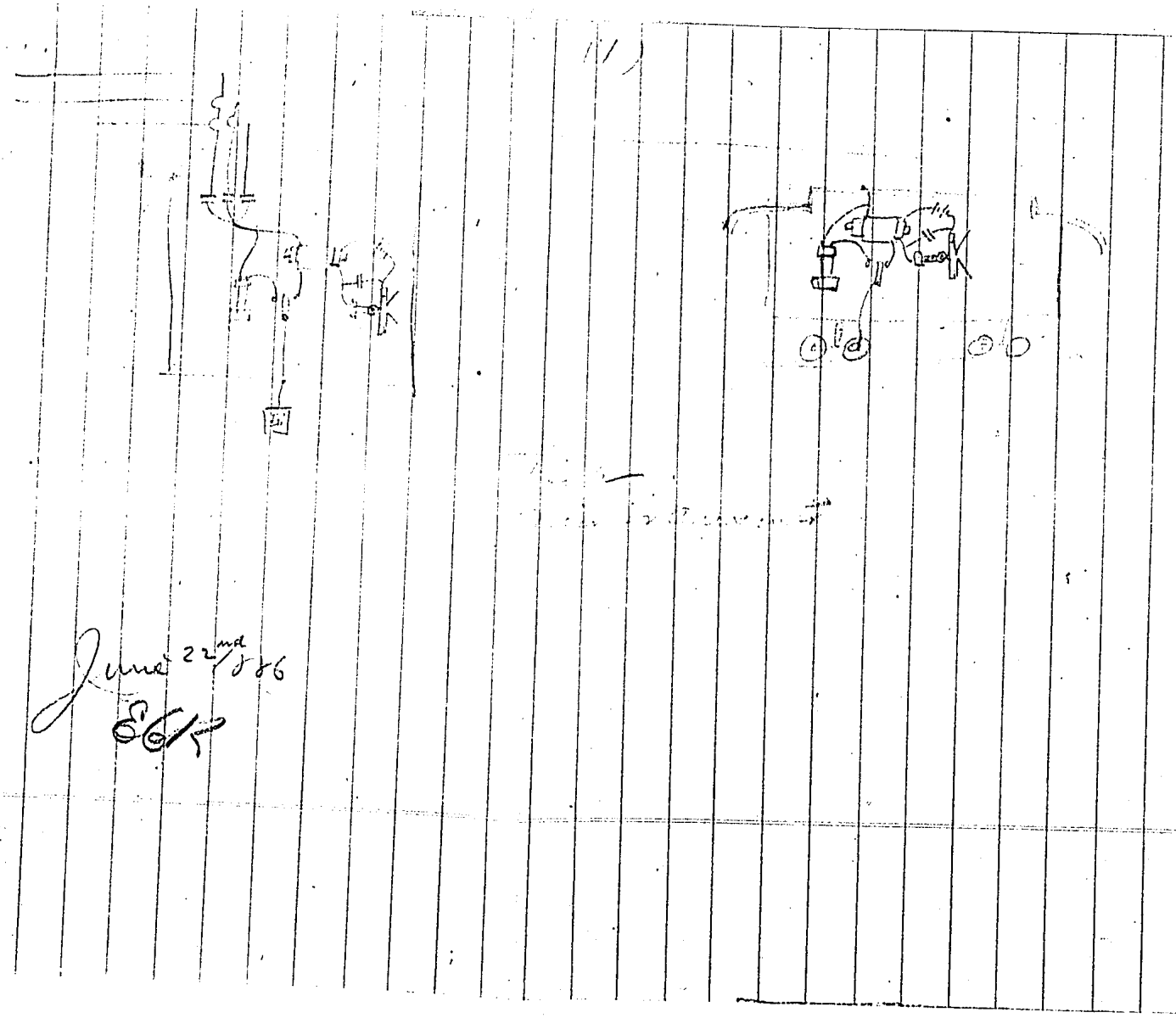
Howe Head 5

Dyer –

I take out patent on this. In addition to regular phonoplex I add another receiving phone just the same as the phonoplex phone except it has a light weight and has an upward limiting nut so the diaphragm can't throw it up more than $\frac{1}{1000}$ of inch – This weight responds to the rapid vibrations thrown on the wire by a local self make & break telephone diaphragm X C is a 7 ohm primary coil – when key N is closed the diaphragm vibrates and its [illegible] self makes & breaks, thus causes the coil to send waves – The phonoplex phone is prevented from responding by being shunted with a small Condenser which nearly wipes out the rapid occurring but weak vibrations of the harmonic & in addition is provided with so heavy a weight that while the strong phonoplex waves lifts it no single harmonic wave has the strength. Thus I get 3 messages over a way wire.

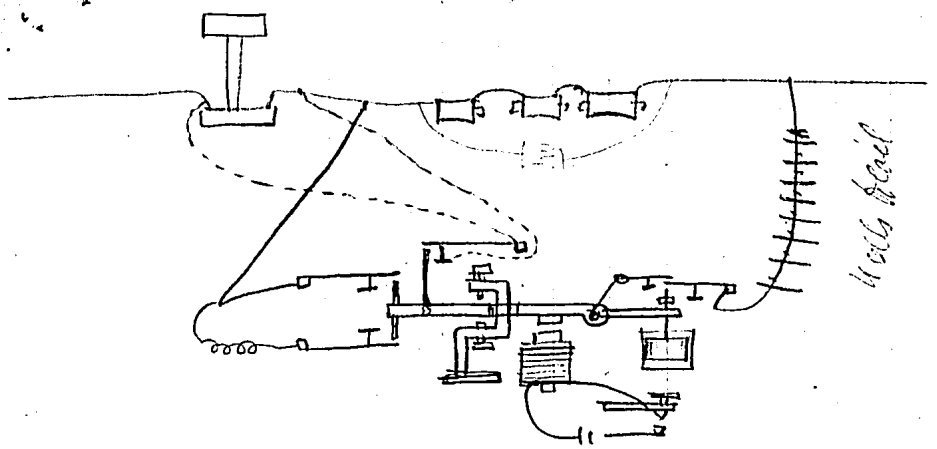
T A Edison





June 22nd 1986

(2)



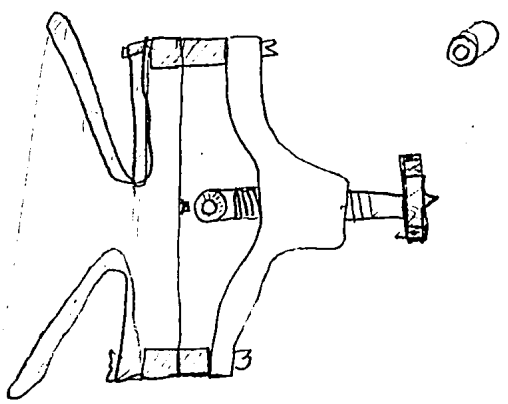
June 22/86
EGR

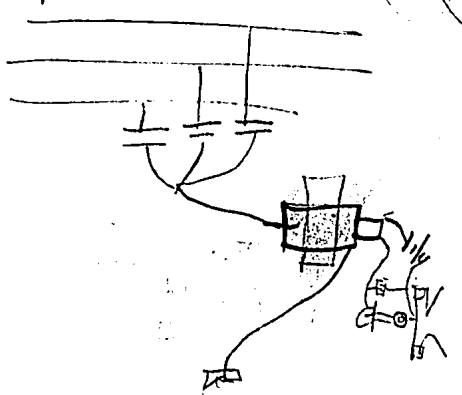
RICHARD N. DYER.
H. W. SEELY.

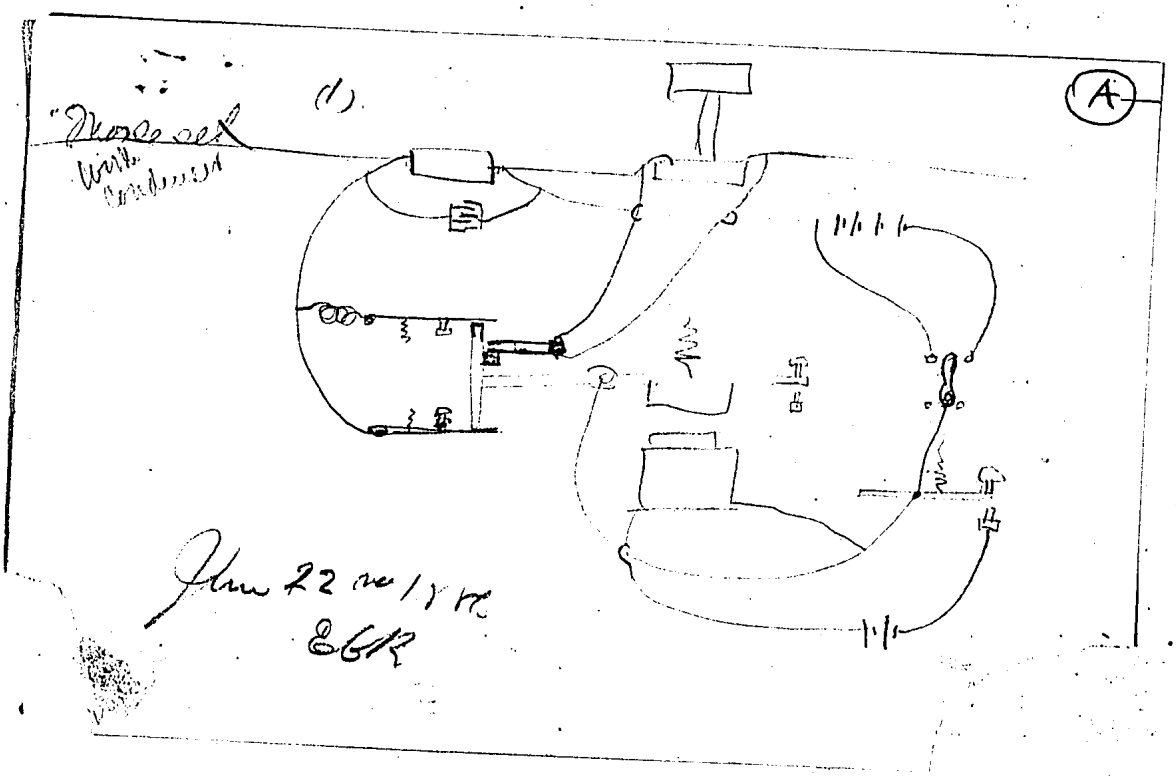
CABLE ADDRESS,
"VERNERVE, NEW YORK."

DYER & SEELY,
PATENTS,
No. 40 WALL STREET,

NEW YORK, ..... 188



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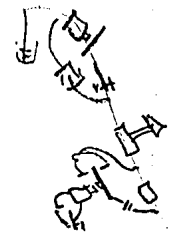
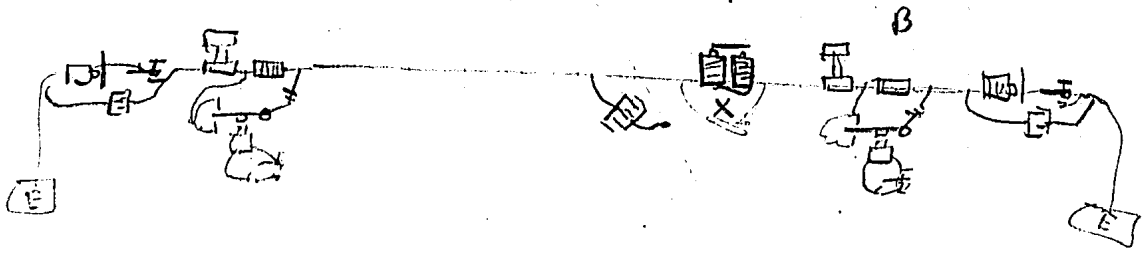
A

(1)

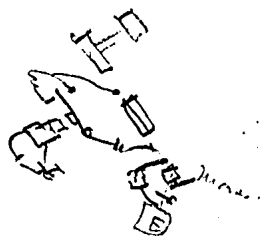


X Either out or in —
in if you want cut B off
out if you want one general
Phone ckt —

B



June 22nd 1886
E612



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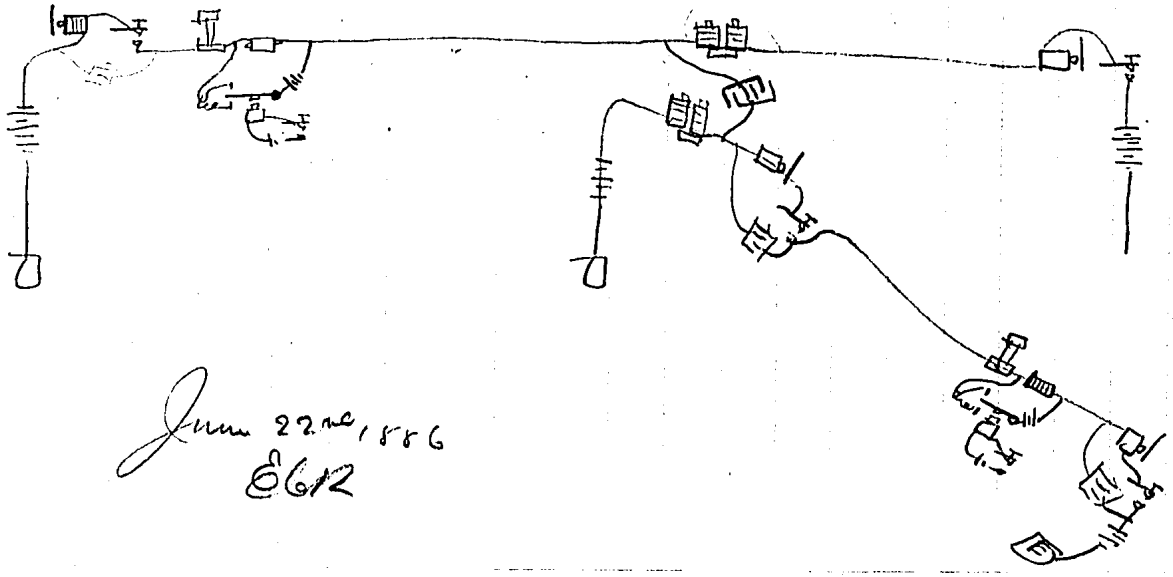

June 22nd, 1886
E612

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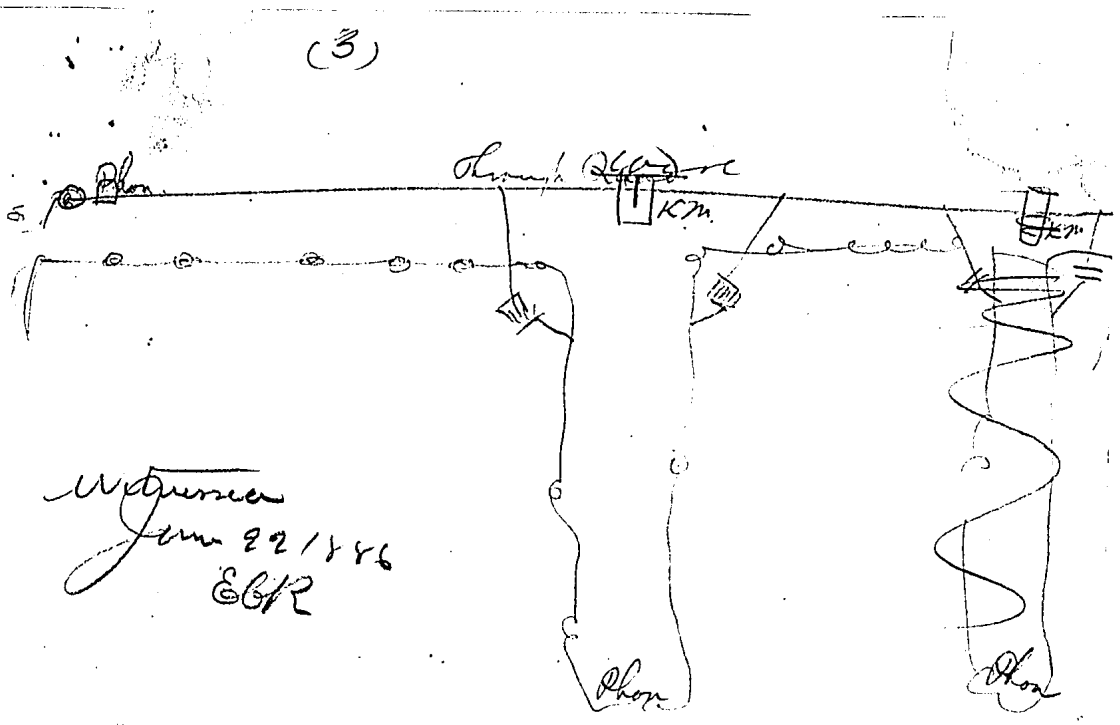
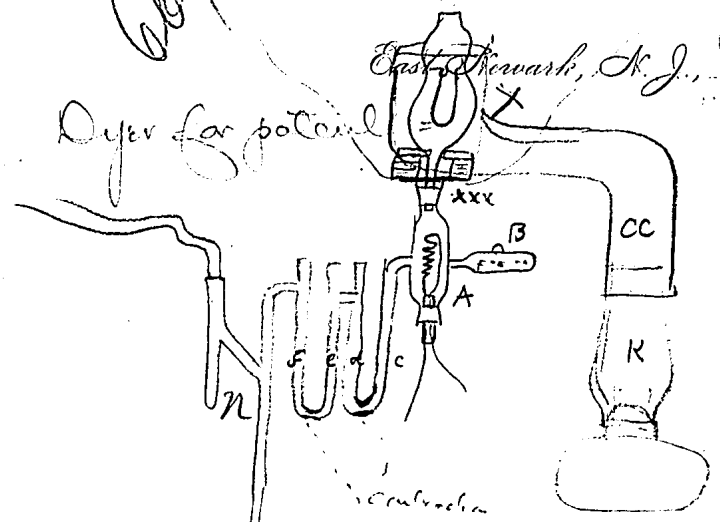



Jan 22/86
EGR

THE EDISON LAMP CO.,

East Orange, N. J., July 7 1886.

Dyer for patent




Soak patent
which we can divide
into other patents when necessary

Process for Carb

The object of this invention is to suppress the Mercury Vapor in the Lamp and to get rid of the vapor of Water.
N is the ordinary Mercury pump. f is a Tube filled with clean Lumps of Antimony or Bismuth;
e is filled with crystals of Iodine, d & c are filled with Antimony or Bismuth, A is a chamber containing an iron spiral which can be brought to a red heat by the Current regulated by a Rheostat X is the Lamp to be exhausted

# THE EDISON LAMP CO.,

2

East Newark, N. J., ..... 188...

B is a tube containing phosphoric anhydride or other absorber of water vapor K is a Lamp provided with a chimney CC which surrounds & serves to heat the Lamp which exhausting XXX is an Electro Magnet which is energized when the filament is first heated by the attraction between the current in the filament & the lines of force of the magnet serving to pull or attract the filament downwards at its central point thus keeping it straight The filament being once set at high incandescence will not afterwards change.

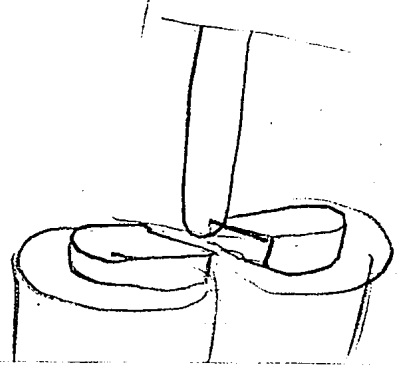
The Lamp heating the bulb causes also the gases & watery vapor to be driven off the surface of the glass & is absorbed by the phosphoric anhydride or decomposed by the heated carbon spiral leaving Hydrogen which by its great mobility is soon taken out by the pump. The mercury vapor cannot pass to the Lamp

THE EDISON LAMP CO.,

East Newark, N. J., ..... 188....

3

as it combines with the Platina to make a
solid Double of the same. The
Iodine vapor as it passes to the
pump or lamp as it combines with
the platinum & Burnetts to form
said Double especially metals,
instead of the iridium other metals may
be used that decomposed with a high
temperature & alloys -
Instead of heating with the current,
powdered metal can be placed in a
tube connected with the vacuum &
brought to a red heat by outside heat
as a flame &c, The magnet for
straightening should be arranged
thus

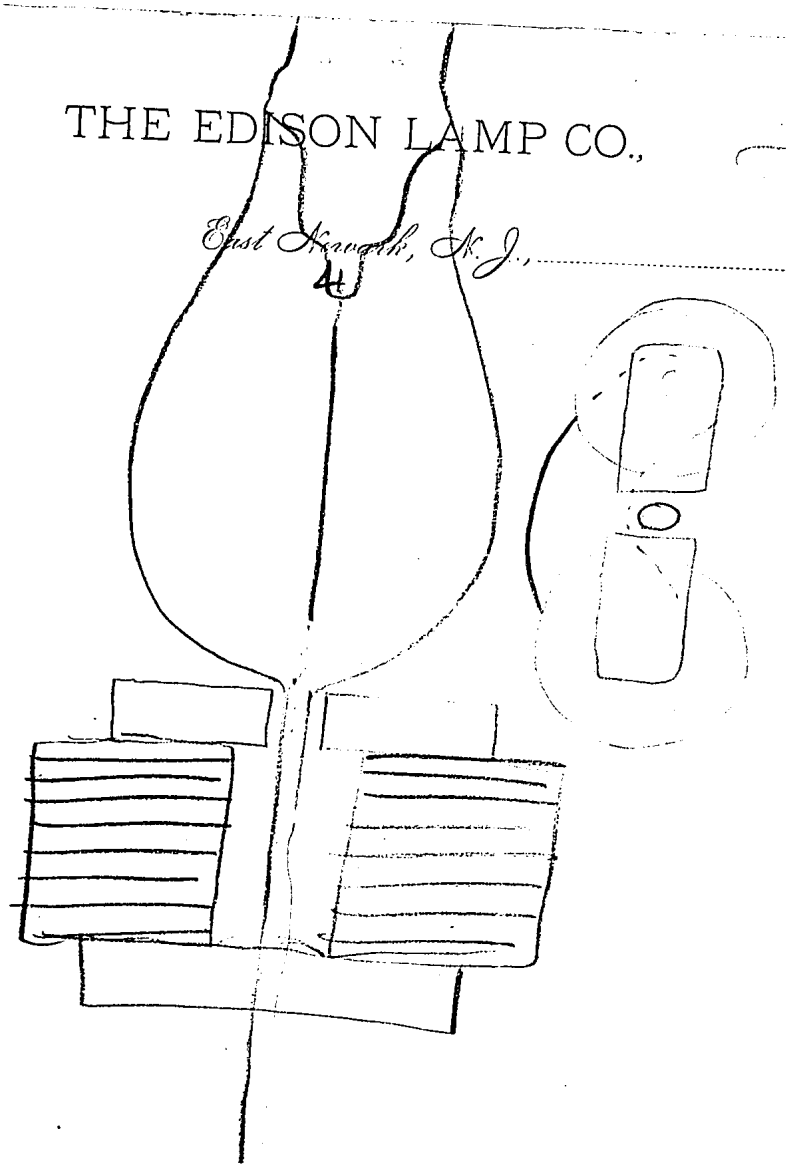


4

THE EDISON LAMP CO.,

East Newark, N. J., 188

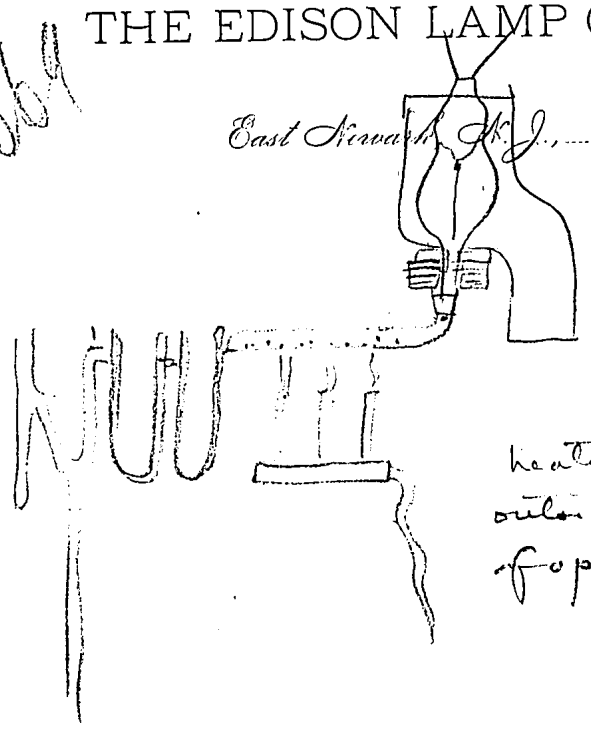
41



Instead of having the spiral in the pump each lamp may be provided with an iron wire connected across the clamp rod under the carbon filament. as the iron wire is drawn up to a point with a [illegible] with a [illegible] Rhodomontade Tungsten less than will heat the filament. The wire when a vacuum is obtained is brought to incandescence [illegible] afterwards the wire is melted & by means of a Magnet drawn down out of the way [illegible]

THE EDISON LAMP CO.,

East Newark, N. J., ..... 188...



heating metal from outside of lamp when desired for operating

T. A. Edison.

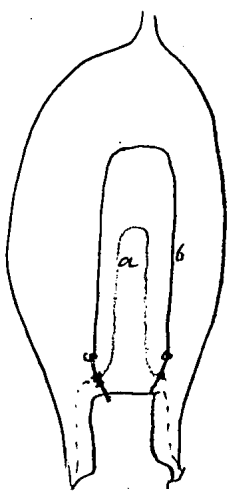



fig 4

a is the carbon wire

b the regular filament of Carbon

T. E.

Patent acct
Lamp Co—

Ft. Fairview Glyn Park
July 1 1886

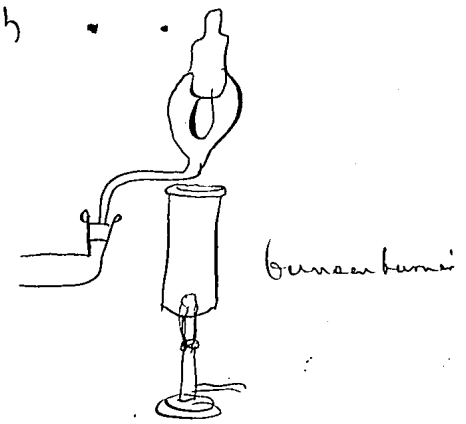
Soak patent—

To effectually absorb all the water within the Bulb of the lamp and to cause water to be formed so that it may be absorbed so as to get rid of the Oxygen a object of the patent, ~~and~~ after the Lamp has had all the water taken from it by passing pure dry Hydrogen through it from a pounce of Hydrogen gas all the air driven out by displacement due to the inrush of the Hydrogen, a small pellet of ~~an~~ absorbing substance such as phosphoric anhydride is put in the lamp and while it is full of Hydrogen put on the pump and exhausted, and Oxygen present combines with the Hydrogen by the action of the incandescent filament & forms water & a low incandescence this is absorbed by the pellet of phosphoric anhydride which remains in the lamp after it is sealed off and ready for market, it also absorb any water as water that might have been in the globe. A piece of phosphorous may be used instead of the phosphoric anhydride & this is ignited while Oxygen is still in the globe & before the Hydrogen has been passed the phosphorous burns to phosphoric anhydride

should be put in a small receptacle
so that in burning the white cloud
of phos anhydride will not
rush upward & coat the side
of the lamp — Chloride of
Calcium & other absorbant
may be used but phosphoric anhydride
I think is preferable. The
pelet when put in the lamp
must be made to fall to the
bottom of the lamp where it
will adhere and where it
will remain during the use
of the lamp. as even phosphoric
anhydride gives off a slight
amount water when strongly
heated. ~~Instead of Hard~~
~~a~~

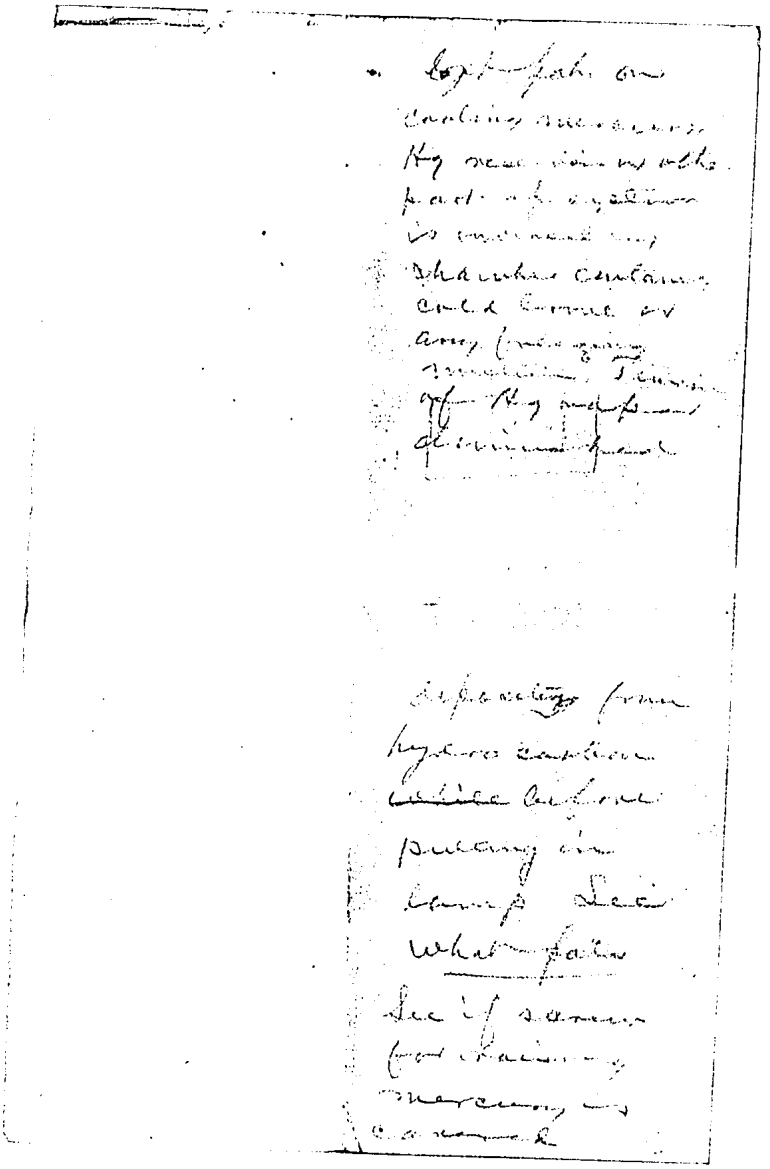
Want a strong claim on this,
The use of Hydrogen in the
lamp as the gas to start
with to Exhaust and a
powerful water absorbant
Either in the pump or allowed
to remain permanently in the
Lamp is used, the latter preferable,
Claim heating the filament
at first to lower incandescence
that is to be burned at to
cause the Oxygen to combine
with the Hydrogen to form
water —

PS I forgot to mention that,
While the lamp is being Exhausted
the bulb is heated carbureously by
immersion in hot oil bath
or from heat rising from a chimney
of flame. Thus —




Make a claim for this also for
it in combination with the A.
in Lamp & the dryer in Lamp
or pump —

Edison



Patent No 2
Lamp Co account Llewellyn Park
Soak patent July 1 1886

168

Dear -

Take out patent on the a sprengel pump same as we use except the use of Sulphuric acid instead of mercury to get the vacuum The fall tube is about twenty feet long we use lead of Hardrubber fixtures + mechanical pumps to handle it = The Sulphuric is very strong, get broad claim, object is to dispense with Mercury as its Expensive and dangerous while the men can protect themselves by wire masks for accidents, they suffer from the insidious Mercury besides it gets the Vacuum free of Mercury vapor ~~on~~ The ~~foot~~ very little vapor from Sulphuric acid may be absorbed by a substance which will combine with it such as an oxide of

a metals through which the
vapors must pass before getting
to pump - it acts also as a
drying agent though I prefer
to still use the phosphoric
anhydride in addition - it
doesn't break the tube by pounding
+ the tube is always clear -

Edison

P.S. No difference in pump
from the regular except length
of fall tube

July 7 1886 Tag

Object is to get rid of the water vapor

fig one has a contraction C to cool lamp off of pump. A is tube filled with glass coated with phosphoric anhydride or other water absorbing agent. d is a contraction drawn to a point + sealed E is two or 3 turns of iron wire hung on the hook. The Lamp being sealed is first put into an iron chamber + brought up to 600 to 800 degs fahr. The aqueous vapor being absorbed by the phosphoric acid in part combines with it + cannot again go down

2

off by heat. The bulb is kept at this temperature for an hour or two it being glass sealed no atmosphere can enter ~~the~~ The steam is then passed through a section of rubber tube coated with Vaseline + put with the Cup G of the pump. a magnet F is then brought up to G is the attraction for the iron around the hook E is sufficient to break it off + the pump is started. The phosphorus absorbs the water entirely

an as the diffusion of aqueous vapor is slow none again Enters from the pump as the lamp is heated by a chimney & lamp while being Exhausted.

Fig 2 shows a method of decomposing the Water by powdered clean iron in B. The Lamp is put in a chamber & heated to 600 or 800 deg faher while the steam extends downward or outward through the chamber is is heated to a dull red The iron combines with any



free Oxygen as well as decomposes the water vapor setting Hydrogen free. The Sealed hook E is broken off by magnet.

fig 3 shows an iron spiral which acts the same as Fig 2 (Except the spiral is kept red hot while the Lamp is in the heating Chamber) by an Electric Current.

Dyer & Sawyer
Patent.

July 7 1884
#269

Fig 1

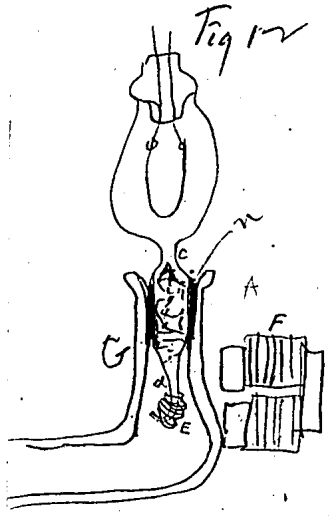



Fig 2

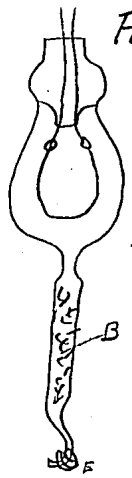
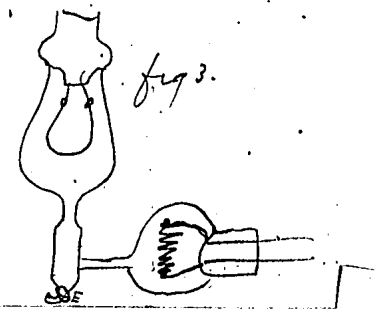
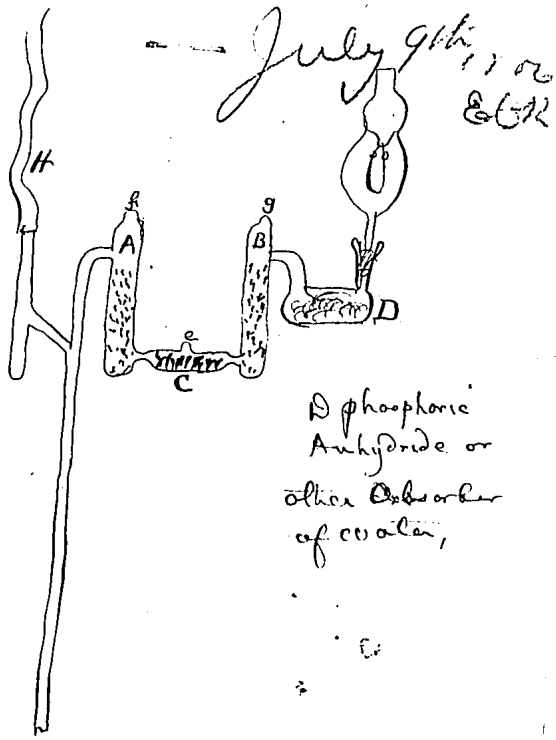



fig 3.



July 9th, 10 or
E&K




Dyer — Take out patent and assign to Lamp Co for following. They are a series of Soak patents hence broad claims

A & B are tubes containing an absorbant of Chlorine Bromine or Iodine Vapors such as Quicklime & such metals as pieces that Combine with Chlorine at ordinary temperature or slight increase of temperature above the ordinary such as Copper Zinc Iron, alkali metals



C is a tube containing solid Iodine or a salt of Iodine which gradually gives off vapors of Iodine or a Chloride which gives off free Chlorine gradually or a Chloride that gives off its (Chlorine) heat slowly by a gentle heat such as Bichromate of Chromium, or an inert porous material like Charcoal etc Saturated with Chlorine gas Bromine & salts acts the same as Chlorine

The object of this trap is to prevent mercury vapors from passing from the drop tube to the lamp. Iodine Chlorine or Bromine all attack Mercury at ordinary temperatures forming an Iodide Bromide or Chloride Consequently no mercury reaches the Lamp — The object of tubes A B, is on the one hand to prevent these gases or vapors from going into the fall tube where they would Combine with the Mercury & dirty the tube so it wouldnt work & on the other hand prevent the gas used from Exiting from the Lamp, the metals or the tubes are attacked

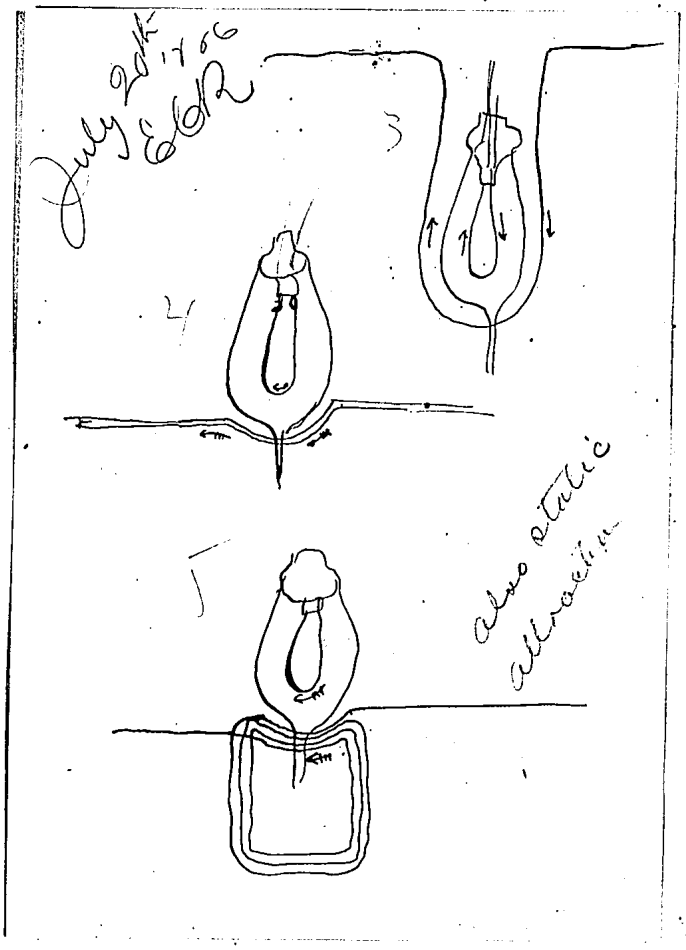
by the gases from (3) Solid Chlorides, Bromides or Iodides. There are absorbant substances that will absorb the gases in the pores of the same that could be used in A & B such as ~~Chalk~~ oxides magnesia, Charcoal & other inert substances that absorb gases, a compound could be used with which the gas or vapor combine, such as Quicklime in the case of chlorine. The object of getting the Mercury out of the globes is to ~~pro~~ diminish the blue and lengthen the life of the filament. effect of Vapor on [illegible]?
I suppose you can make a claim for a Chemical substance between the Lamp and the Mercury pump which will combine with the Vapors of mercury to make a solid. There are other Chemical substance which when mercury passes through or over them combines besides the ones named such as Solid Sulphur, Vapors of Nitric acid

(4)
in fact any chemist could off hand suggest a dozen things in A B & C that would accomplish the object hence I want to get very broad claims —

T A Edison

Menlo Park
July 1 1886

To E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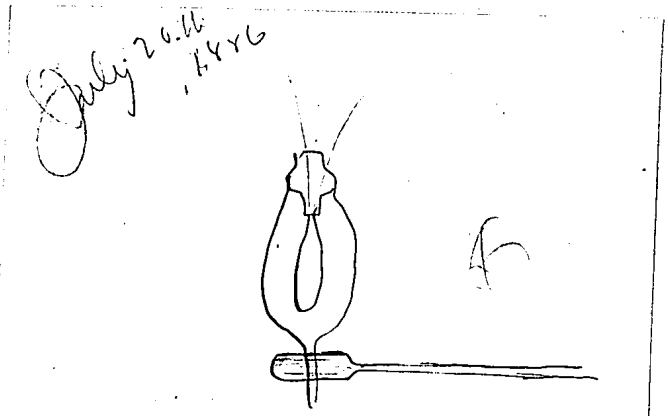
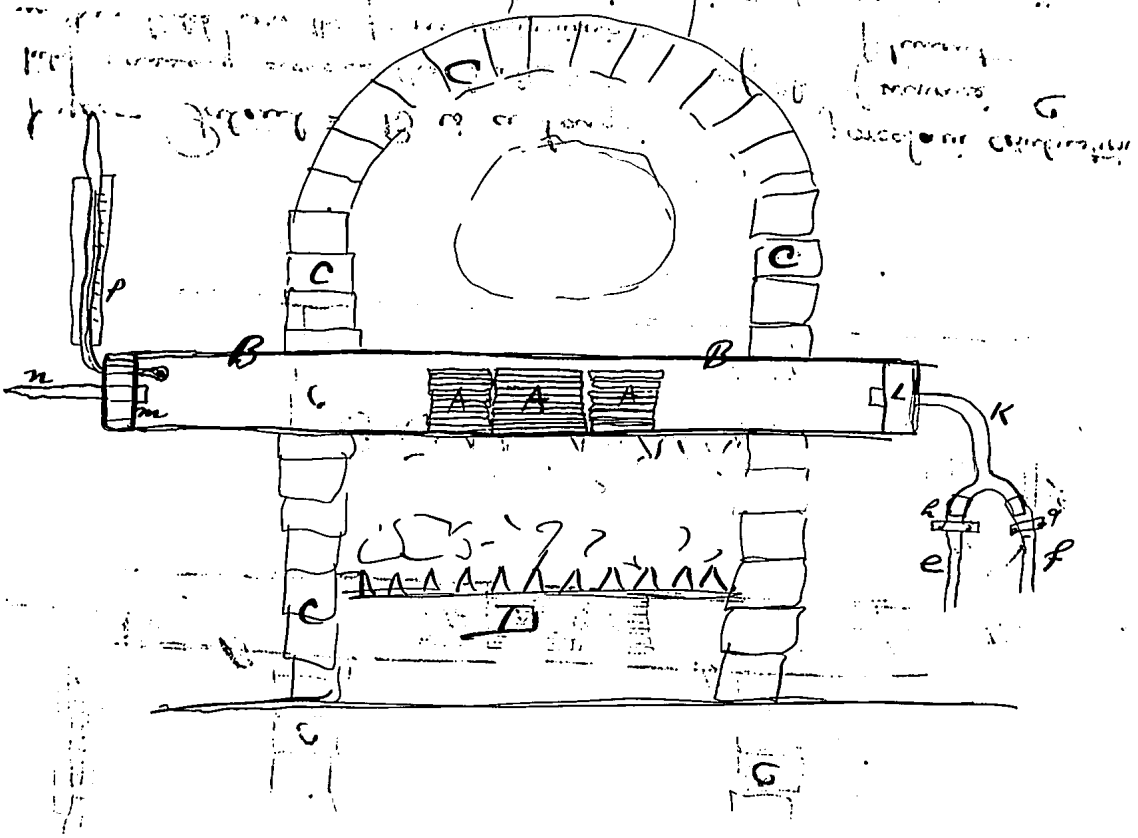
Edar
3
4
5
Abdominal
Abdominal






Dyer – Patent: B is a large unglazed porcelain combustion tube passing across the central part of the furnace C in this tube are the forms containing the fibre or filament of bamboo or other material not yet carbonized. The moulds keep the filaments under steam + pressure, The Combustion tube is closed + luted at both Ends p is a Thermometer to show the temperature of the Exit gases n is a tube with fine bore at End to allow gases to pass out, K is a two way tube one connected to a Hydrocarbon gas or vapor the other with Chlorine. both gases or vapors are dried by ~~drying~~ drying agents to take up the water vapor before entering the tube, The object

August

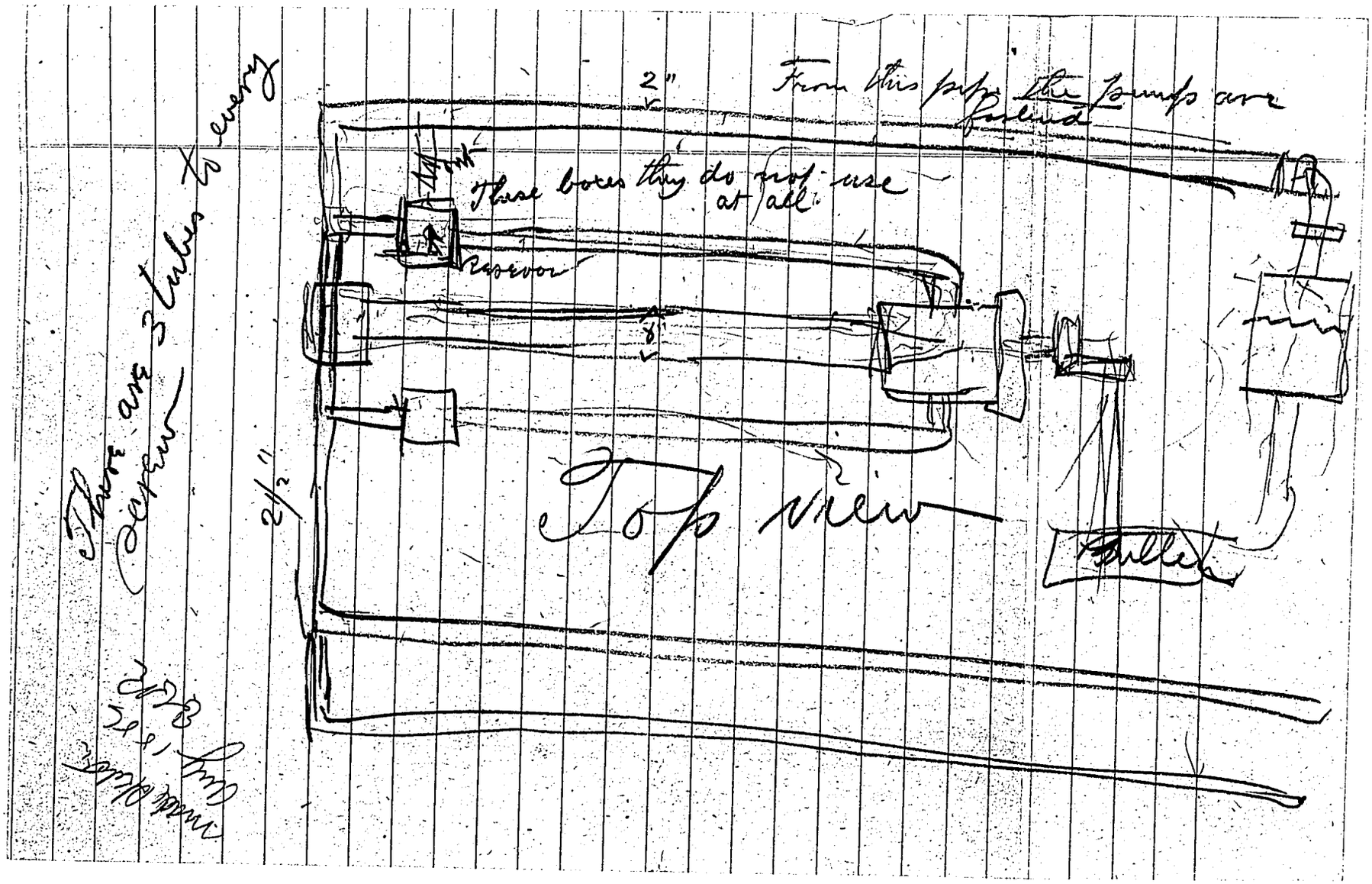


of the Chlorine is to cause the Hydrocarbon gas or vapor to decompose at a lower temperature than the Chlorine having an affinity for the Hydrogen of the Hydrocarbon although the use of Chlorine is not absolutely necessary it is better to use it or any other gas which has an affinity for Hydrogen such as Bromine, as Carbon will be deposited in an finely divided state of the Carburization — The gases are passed through slowly the fire the tube of air & water vapor, the heat furnace is started at a gentle heat which gradually increases The gases passing slowly through during the process, about three to one more Chlorine than Hydrocarbon should be passed say three Chlorine to one of the Hydrocarbon, and the heat is continued up to the highest heat of Carbon by a blower The fires are then drawn & the tube allowed to Cool the Chlorine only being allowed now to pass when is continued until the tube is below 400 degrees for when it is taken out the fires removed and the tube filled with fresh fires of Carbon several tubes can be put in the same furnace. It is not essential that a Hydrocarbon gas should be used as Bisulphide of Carbon can be used alone, without Chlorine,

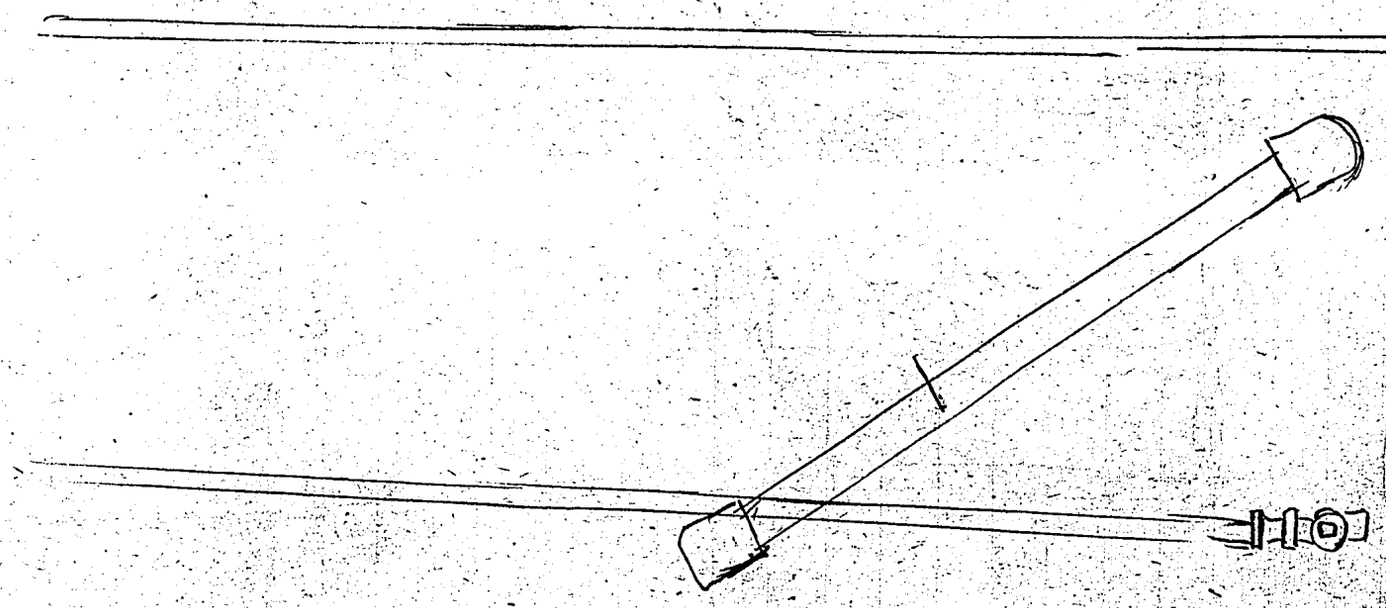
Seeley note = There have been laboratory Experts in analysis where flax leaves straw etc have been put in a combustion tube & decomposed carbon being deposited therein. So you will have to make allowance in the light of this = I put in a different article & have no means for accomplishing the result.

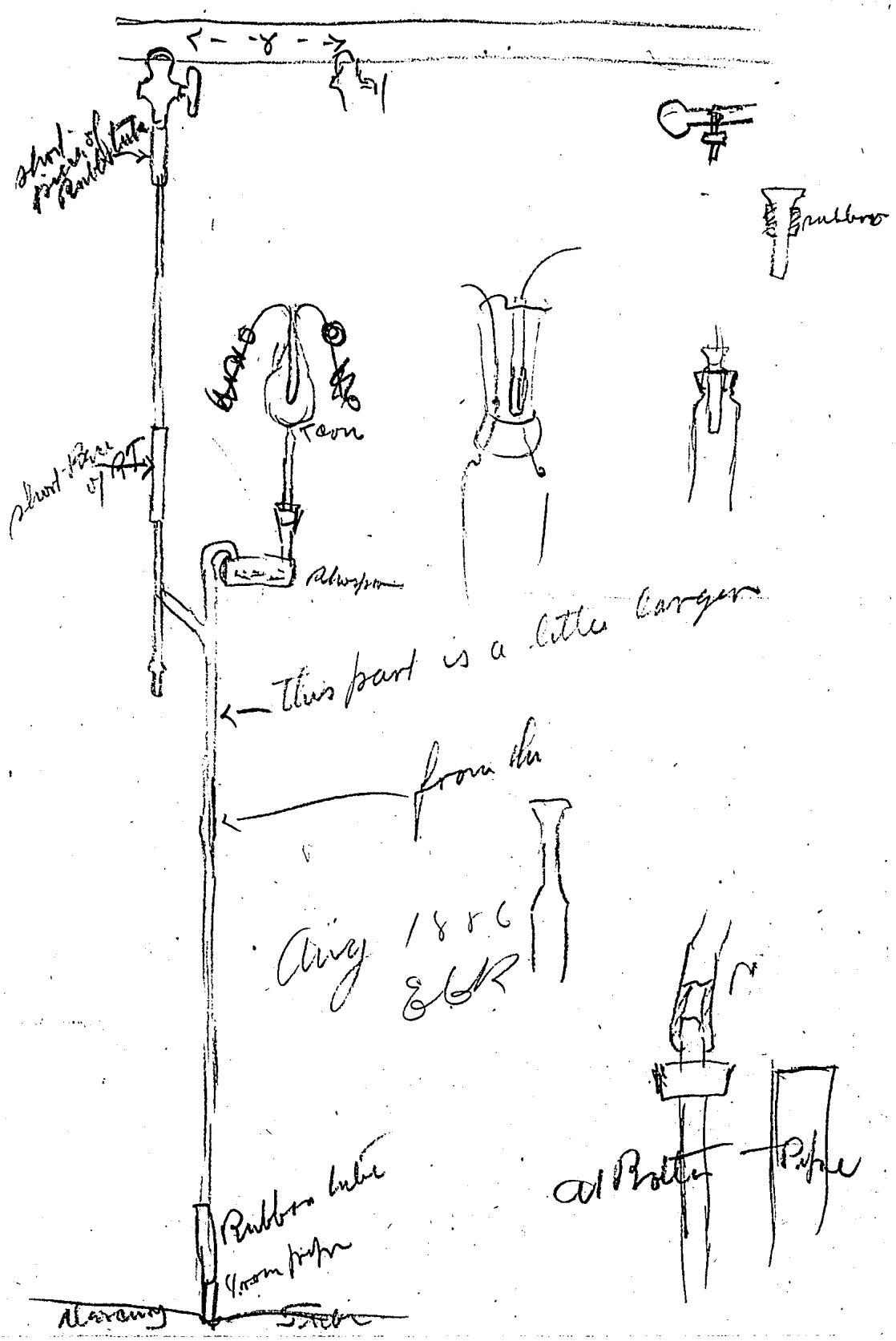
Tos

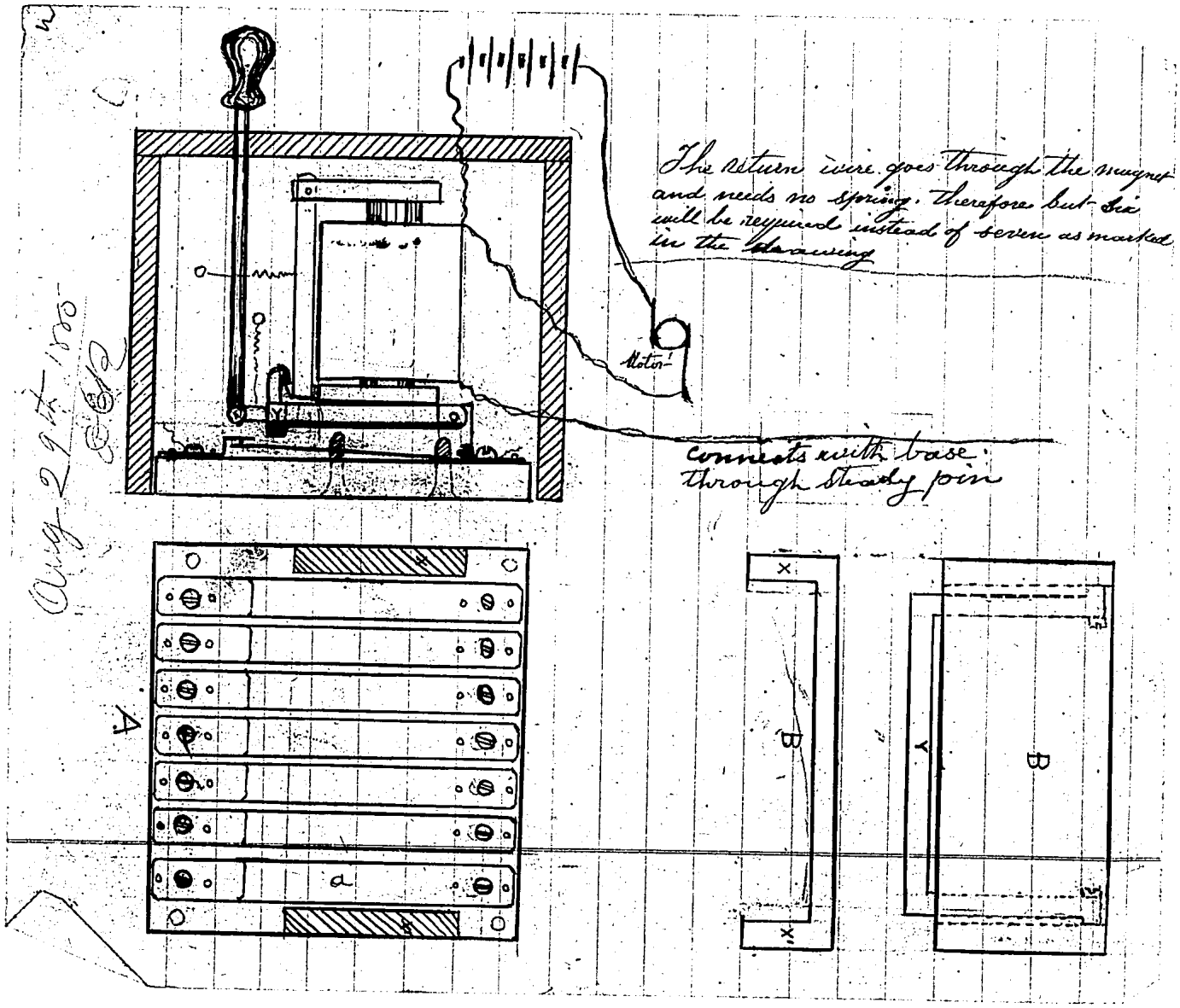
Aug 10 1886

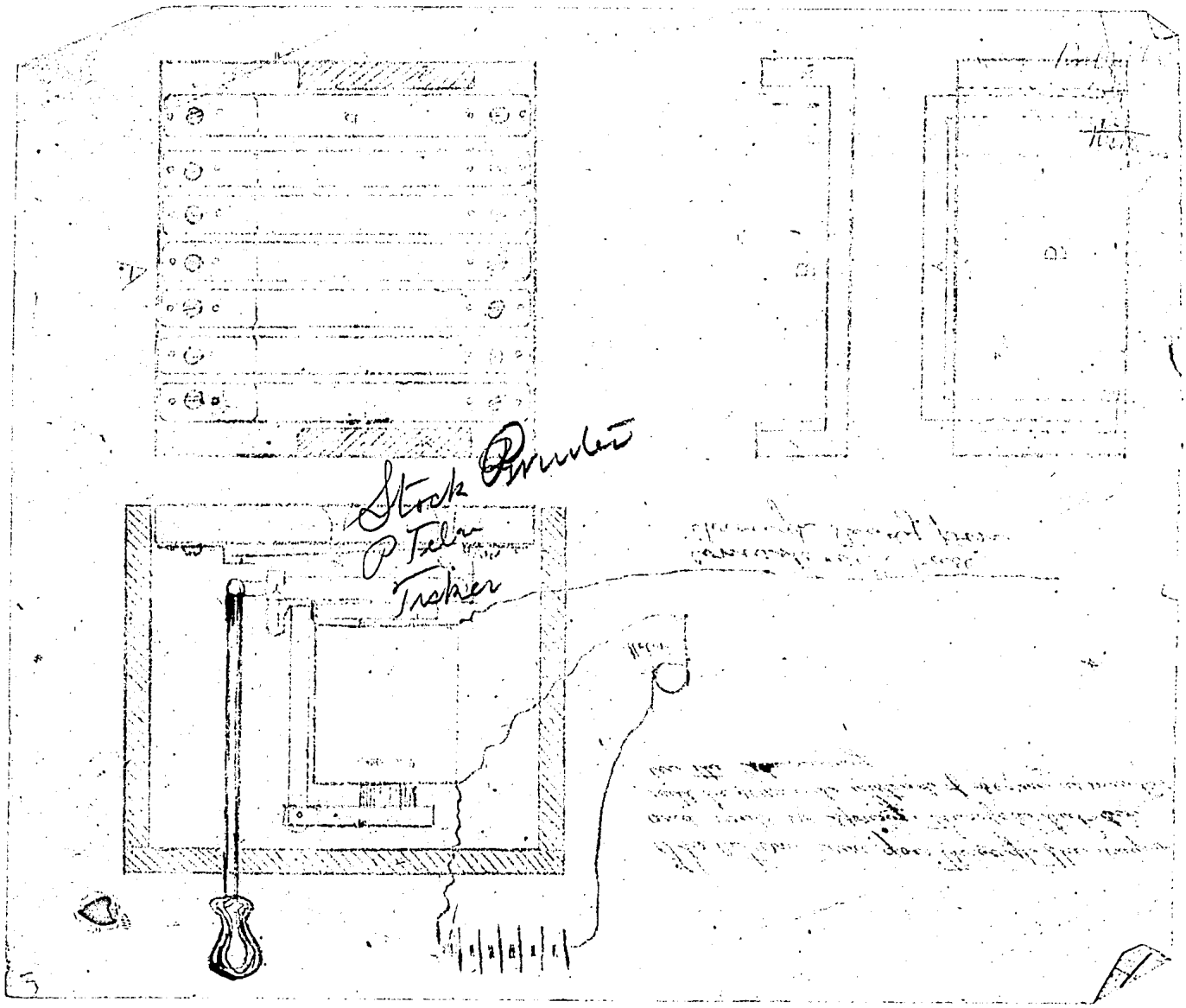

2"
From this pipe the pumps are fueled
These boxes they do not use at all.
Reservoir
Top view
Bullets

3-174

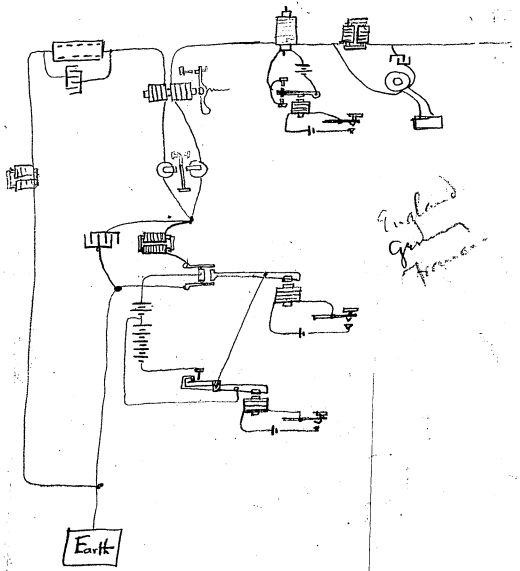



Short piece of Rubber tube
Short piece of
Town
Absorption
This part is a little larger
from the
Aug 1886
Rubber tube
from pump
Aeration
Bulbs
Pipe

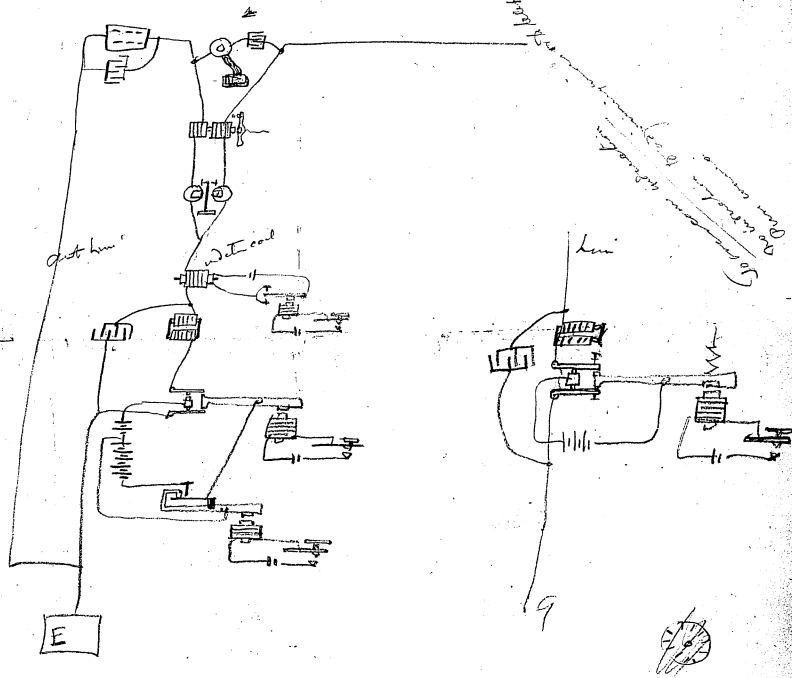

The return wire goes through the magnet and needs no spring. Therefore but six will be required instead of seven as marked in the drawing
Motor
connects with base through steady pin
A
a
B
x
y


Stock Punches
Tesla
Tesla

## Quadruplex on phonoplex wire




## Sextuplex

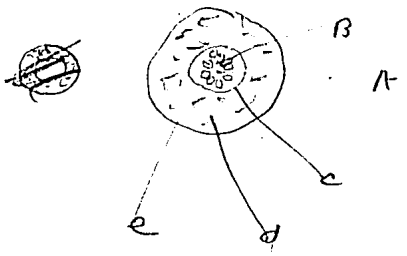


Inc. Sept 26 1896

Dyer Patent

The object of this invention is to make a filament obtain a filament of vegetable matter capable of forming a filament of carbon after carbonization by heat which shall be free from pith cells and be have all parts of the body of the same relative density I have discovered that the roots of the palm + other roots have at their center an isolatedly hard + homogeneous portion from which filaments can be prepared — after drying especially the scrub palmetto which has a root consisting of a spongy exterior and a central core of like cylinder in the center of which is a perfectly round cylindrical fibre in certain kinds of the root and in others a central part from which a cylindrical or flat filament may be cut. fig 1 shows this kind

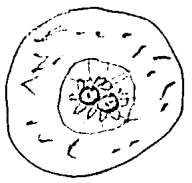
fig 2




B is the outer shell of the root a the spongy material C the large central Core = A is the solid material surrounded with holes very close to each other by splitting the CORE C the central part may be obtained nearly round thus.

fig 3

In all the roots from the scrub palm or palmetto which grows abundantly in Florida —
There are one & sometimes two perfectly cylindrical fibres with small central holes in them which do no harm — These fibres are obtained by splitting the central core



A

A

These fibres have no pithy cores but are the aggregation of an immense number of parallel fibres locked together to each other with considerable force —

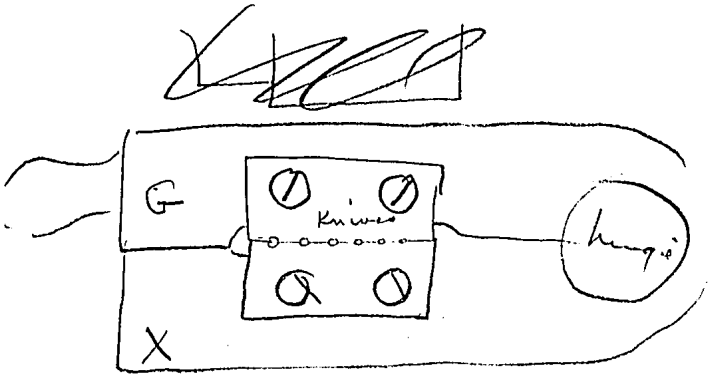
5

The roots obtained be gathered which clean the fibres or material taken therefrom and allowed to thoroughly dry before manipulating them to put them in shape for use.

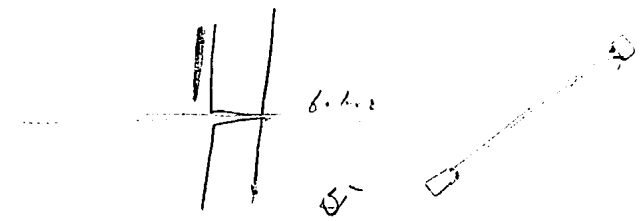
The method of preparing the fibre is by drawing them through a cylindrical cutting die made in two halves. The holes being graduated from large to small the filaments being drawn through successively so as to take a slight shaving each time

fig 3 shows the apparatus

4




The faces of the knives can be ground to keep them sharp — X is fixed G is provided with a handle to open



The fibres are cut the right length and drawn through the first hole afterwards about $\frac{1}{4}$ of each at Each End is not drawn through the smaller holes this allows of enlarged ends on the fibres which are handy for clamping after the last cutting hole. The filament is drawn through a polishing die —

Dick Must this go in two patents - I want to get a broad patent for making a filament for Carbonizing for Lamps made out of the central part of roots of plants or trees —

also a specific claim
for the ~~fi~~ fibrous
central part of the roots of
palms or palm family —
also for the method of
forming cylindrical fibrous
with enlarged
Ends by ~~[illegible]~~ cutting dies.
split or not, its a cutting
draw plate not a draw plate
like wire drawers — also
for the split dies for allowing
Enlarged ends —

Sept 26 1886 –

Deck Patent. 685. 686. 687

I take the vegetable filament before carbonization and soak it for several hours in a solution which contains dissolved carbonizable matter such as sugar molasses, Licorice, Coal tar & these materials permeate the interstices between the microscopic fibres of which the filament is made up the filament is then taken out of the solution the surface cleaned from the adhering solution & then allowed to dry. Afterwards it is placed under steam & pressure in the moulds & then put in closed boxes & carbonized the extra material being between the fibres carbonized & serves to hold them together &

and thus causes the electric current to pass through all parts of the filament equally

Claim –

The strength of the solutions should be of a consistency a little less than table syrup – it may be varied within wide limits and still accomplish the results –

Claim Soaking the filament of previous to carbonizing in a solution containing a carbonizable material in solution, –

Deck – I think some one has soaked wood in sugar etc & afterwards carbonized same

for arc carbons, so draw your claim accordingly

2nd patent

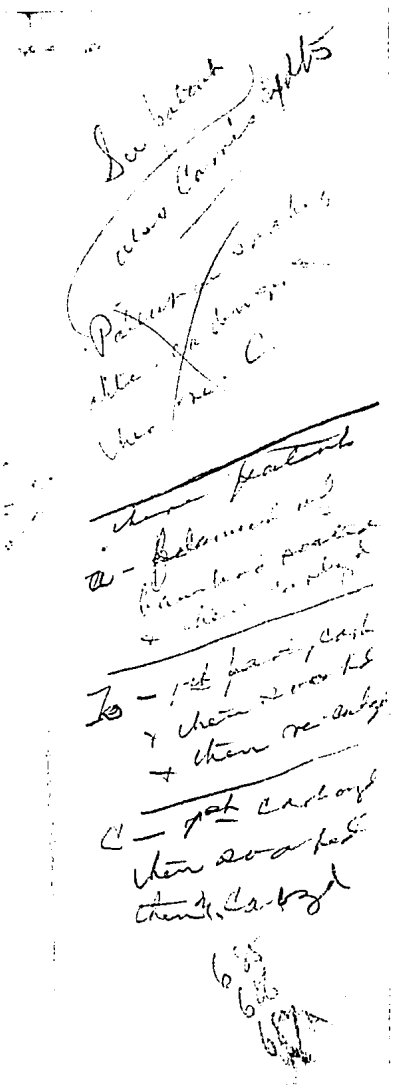
Doing the same thing to filaments already carbonized or partially carbonized & then carbonizing them again & fully

Drek

Carreé makes his arc carbons by squeezing the compound of ground carbon & tar thru a die & carbonizing & then soaking in sugar etc &

recarbonizing - hence you should draw your claims to get around this,

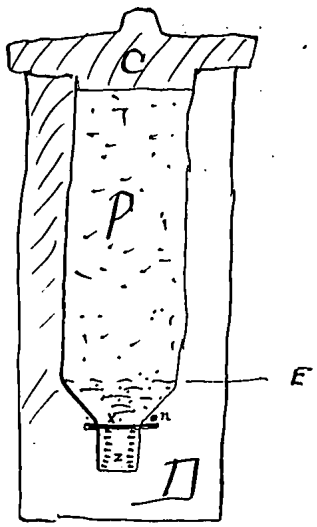
prepare these immediately



Form L. 1200-2-13-'80.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

New York, Oct 8 1886 188




Patent =

Carbonizing under pressure;

Z are a number of filaments of organic matter.
D is a Crucible - C the Cover X a piece
of Carbon to prevent the filament from going
upwards. The Crucible & Cover is made
of Carbon (ie) plumbago D is filled with
powdered Lead up to E & from there to the
Cover with large pieces of Lead

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C
2

New York,..... 188

The whole is placed in a furnace and gradually brought up to a white heat, when the lead melts it surrounds the Carbons completely and produces a great pressure arthem due to the Column of liquid Lead - and as the lead does not boil until the melting point of wrought iron is reached the filaments are perfectly Carbonized & consolidated by the pressure, the lead being liquid allows them to Contract without ~~interposing~~ much resistance — The mould is taken out before the lead has solidified and poured out leaving a little dross around the Carbons which can be removed by acids — In practice it is preferable to put a small carbon box at the bottom of the Crucible &

Form L. 1200-2-18-'86.

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

3 c

New York, ..... 188

Cover the whole with a powdered
alloy of lower ~~fusing~~ melting point than
lead so that the carbons will be
surrounded with a liquid
before any great change takes place.
other metals may be Employed such as
tin Zinc Etc ——

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No. 65 FIFTH AVENUE.

Form L. 1200-2-18-'86.

688
689 1 X
6d 6d

New York, Oct 8 1886

Patent.

Filaments are formed from oxides got in a plastic state by mixing a small quantity of material which combines with the principal oxides such as an alkalin silicate in small quantity mixed with pure oxide of Alumina ~~&~~ Magnesia Zirconia These with water became plastic like clay when finely divided and can be squirted through dies by pressure in the form of "cylindrical filaments. These being bent in shape desired are brought up to a full red heat after which they are taken out & soaked in a carbonizable compound in a liquid form such as sugar Licorice &c

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2 X

Form L. 1200-2-18-'86.

New York, ..... 188

The penetrates all the pores and then the whole is ~~was~~ put in the furnace in a box with powdered anthracite & brought to a white heat the walls of the pores & surfaces are coated with Carbon ~~Hence~~ as the Carbon does not reduce these oxides, the filament will stand a high temperature — If it is desired that a lower resistance filament be obtained a second Soaking & Carbonization can be had of the original porcelain filament may have incorporated with it a small quantity of the Carbonizable Compound in this case no alkaline silicate is necessary as the Carbon will act as a ~~binder~~ — The great advantage of filaments made in this manner is that they have very high resistance hence

Form L. 1200-2-18-'80.

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3 X

New York, ..... 188

very small copper wire may be
used to distribute light over a
large area which is of the
highest importance

See application [illegible]

Also for 263,145

copper

Approved

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

1B

Form L. 1200-2-18-'86.

New York, Oct 8 1886 -

Patent -

I form a filament of clay by forcing it through a hole by a press same as they make arc Carbons etc - or roll it out in sheets and stamp the filament out while plastic; if it comes from the die it is bent in shape and slowly baked until nearly all the shrinkage is out - I then put in a mould surrounded with powdered anthracite Coal & bring them up to a white heat - afterwards they are taken out and put into a tube which can be brought to a white heat & a hydrocarbon gas or volatile compound Carbon passed through it this deposits carbon over the whole surface of the porcelain filament, afterwards the porcelain is eaten away by Hydrofluoric acid or other solvents, the Carbon filament only shell put in a holder on the Ends of the wires running through the inside part of the lamp &

Electric Light Co -

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

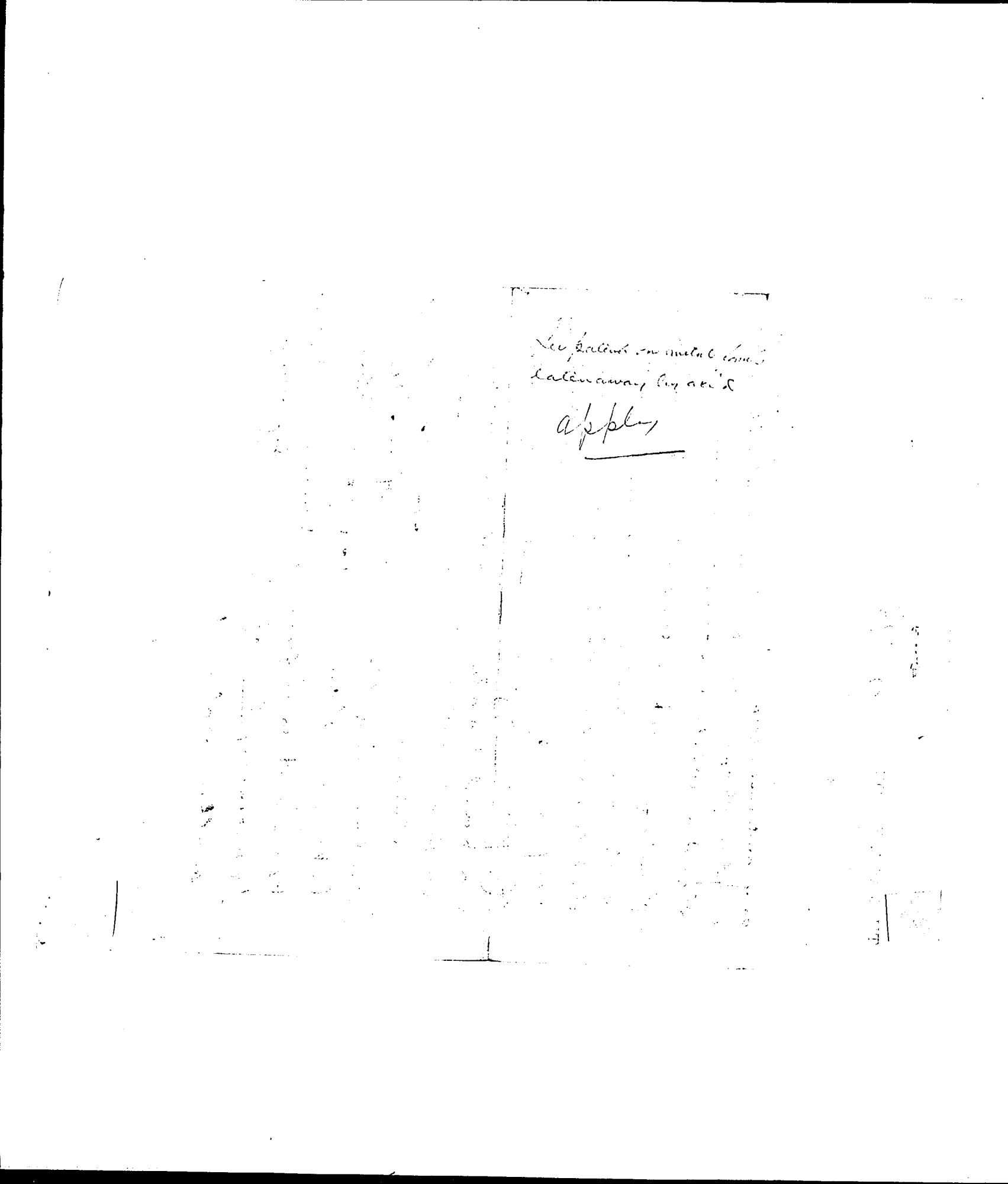
Form L. 1200-2-18-'80.

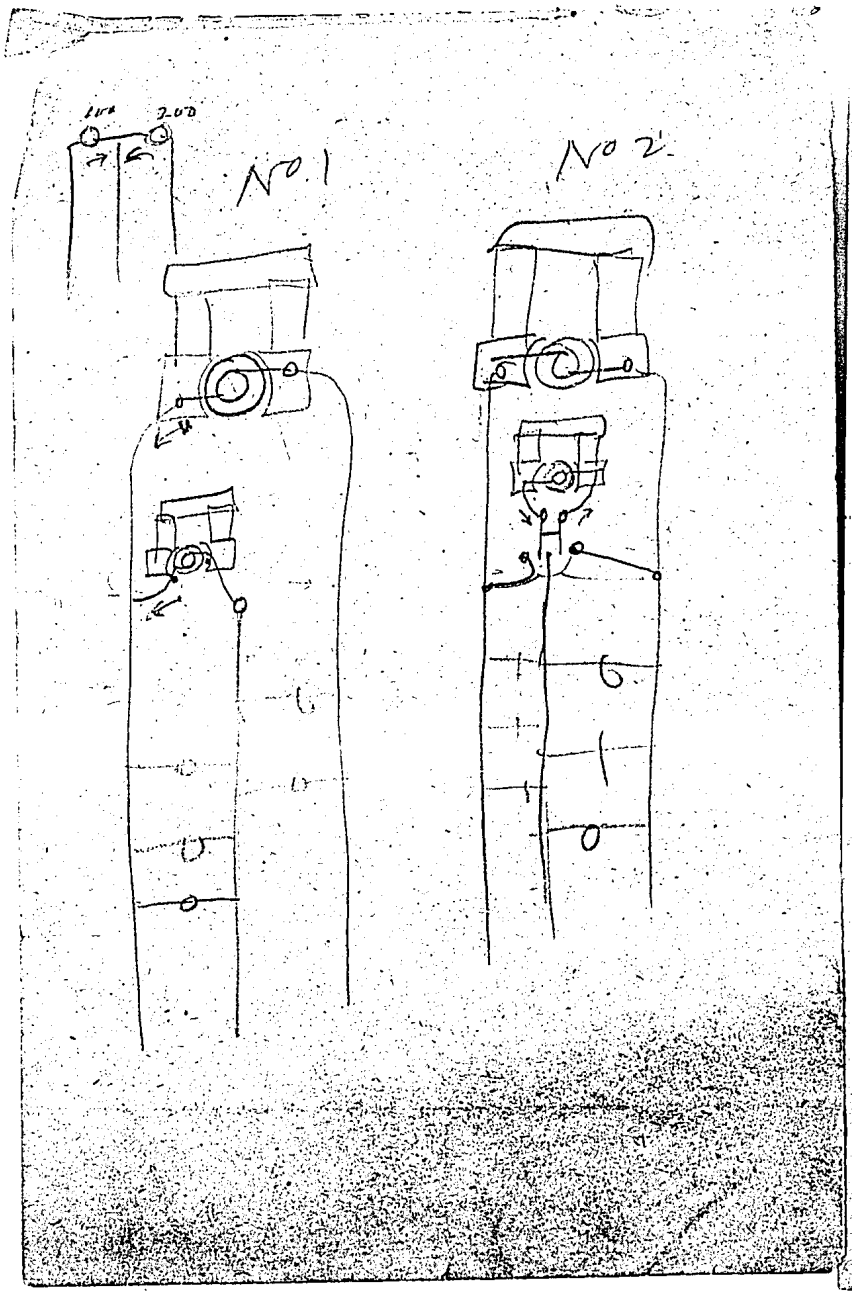
2 B

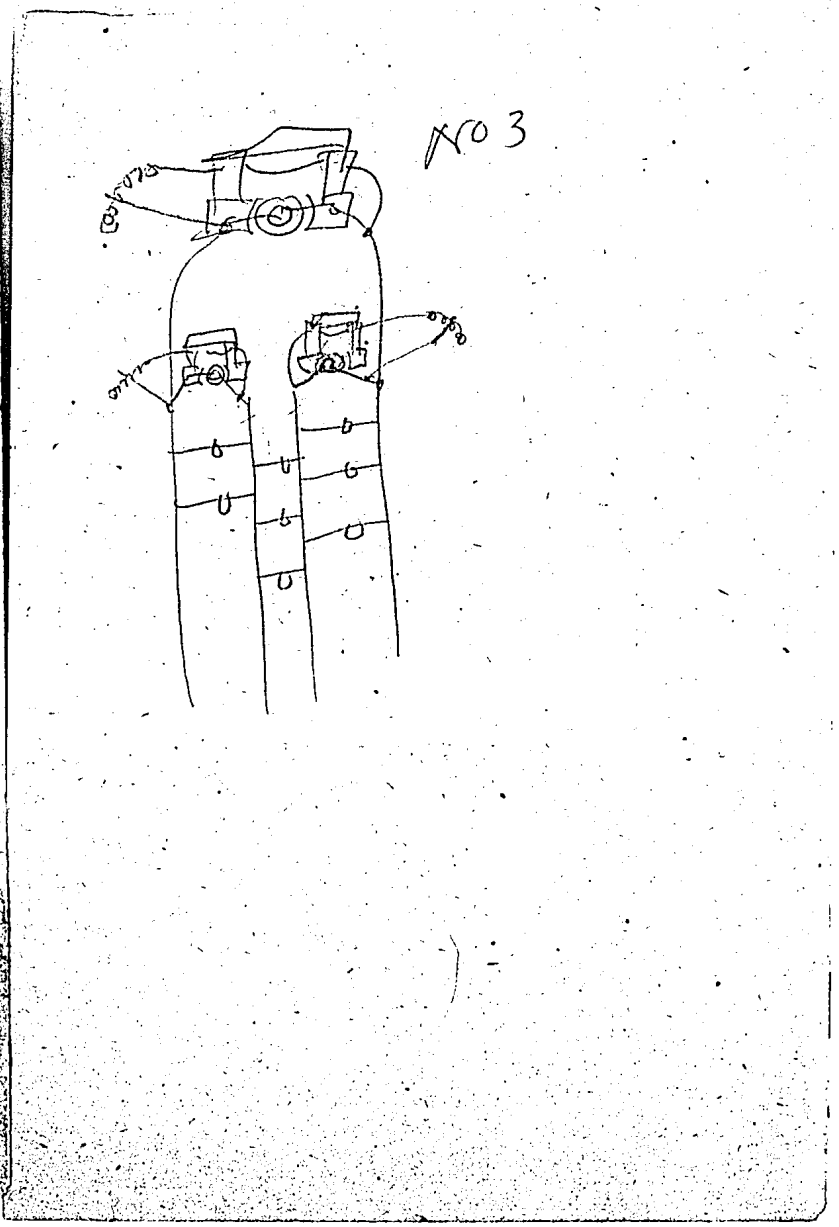
New York, ..... 188

any oxides or compound which can be moulded
or put in shape while plastic & which will
stand a white heat will answer —
Plumbago may be substituted (the surface
of the new conductor) filament — so that
its Entire surface becomes a Conductor
comparing the Current through the filasa
of plumbago. its Coat to incandescence
a hard Coating is formed on the
surface while it is immersed in
an atmosphere of a gaseous compound
containing Carbon — If an oxide
like pure Alumina, Magnesia, or Zirconia
be used it is infusible hence it will not
be necessary to Eat it away by acid
or other solvent,

T. A. E




No 1
No 2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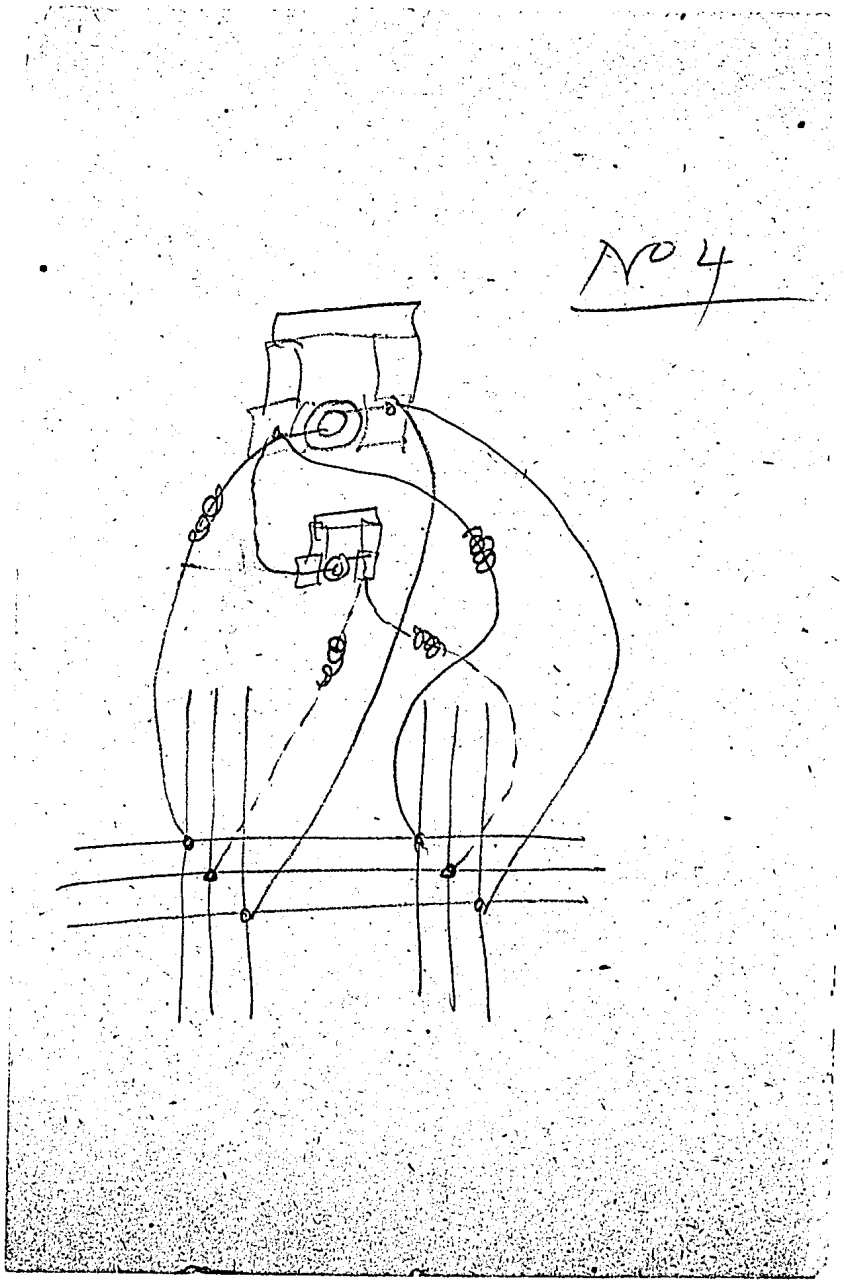
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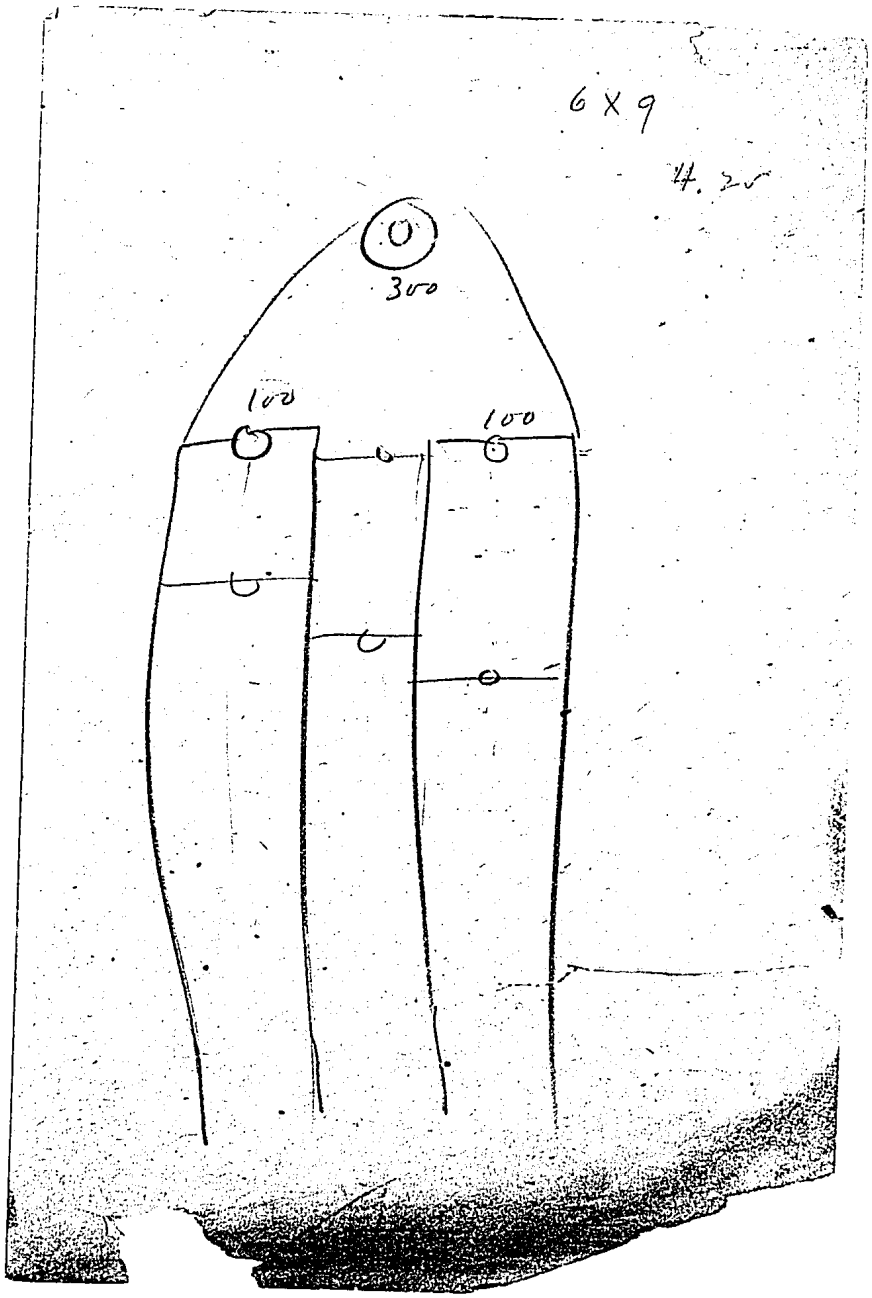

6 X 9
4. 20
300
100
100

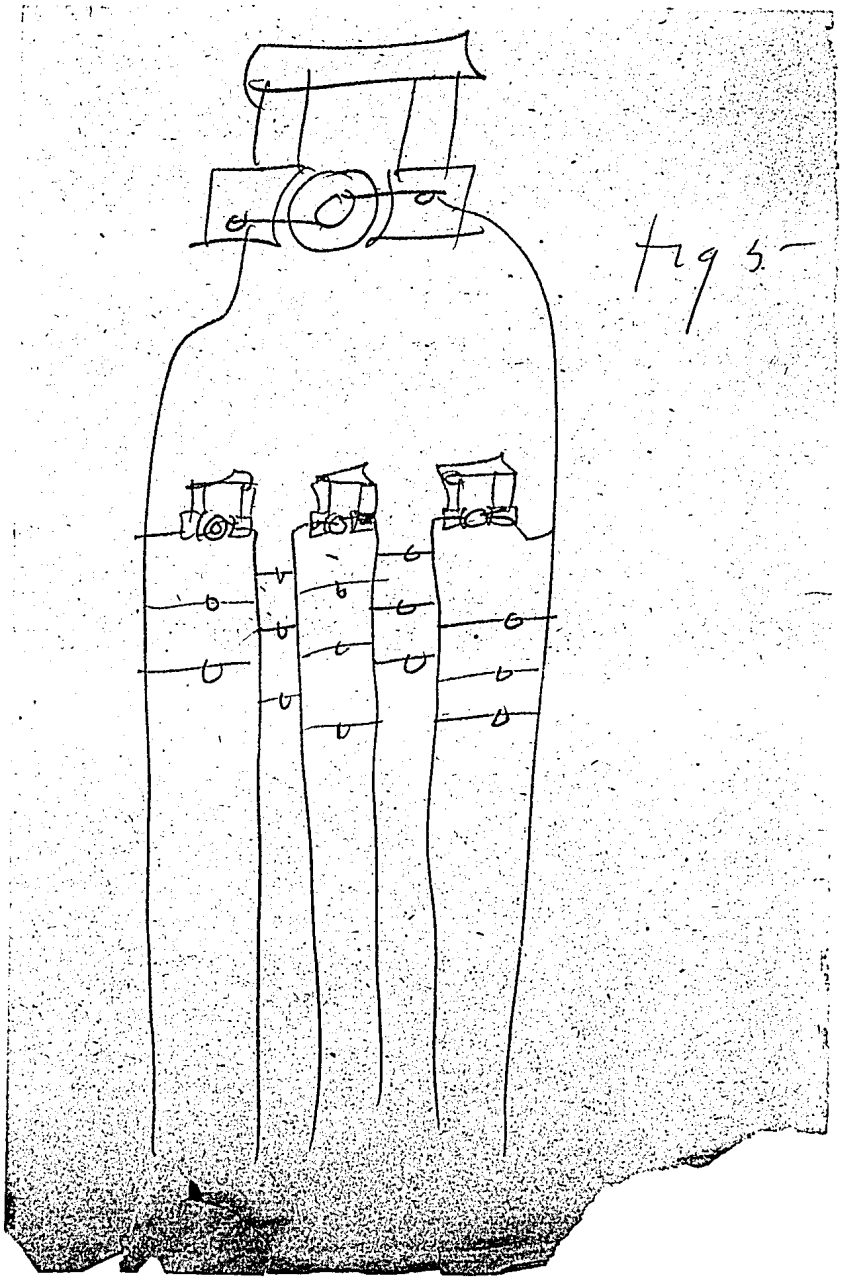


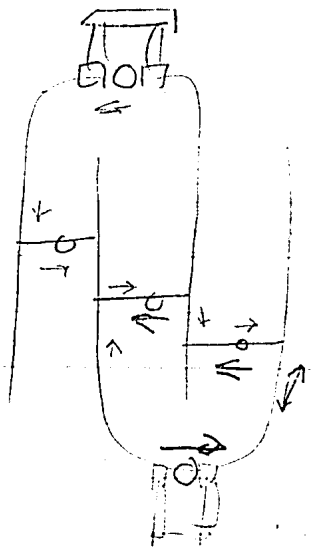
fig 5.

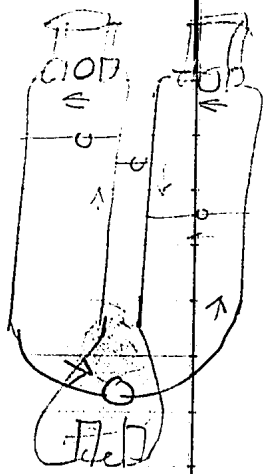
Hence 35-830 hp —

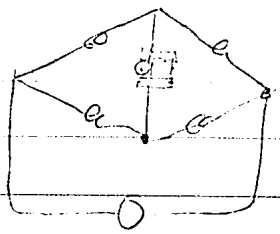
Starting with 35000 hp
& 92 pct dynamo & Loss 2646. making to
at Niagara 30360. Leaving
15 pct in wire Loss 4554 leaving at
Motor terminals Buffalo 25806. Less Motor
Loss 2064 - leaving 23.741. At the
dynamo terminals running in dynamo
Loss 1899. hp - leaving 21842 -
Leaving and Loss in Conductors in
City plus (whole in Conversion Motors
nets. (Leaving 1.747.) ~~Leaving~~ 20 095 hp —

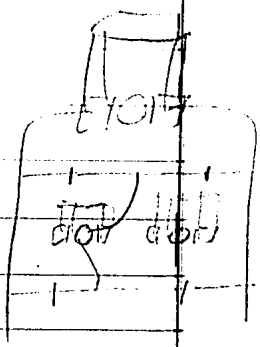
~~No~~ Leaving Loss in City wires
for Motors. 5 per cent. of 10000
hp — & ~~10~~ 10 per cent on 10000 hp
for Lights & Gates) over Lap -
~~The Loss Should have on~~ 500 hp is
5 per cent of 10000. hence Limit
at Niagara 830 hp - for the
12 pct loss on Lightwires Limit
at 2000 hp at Niagara —

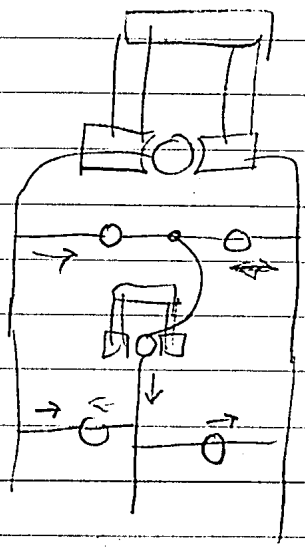
36 pct [illegible]
[illegible]

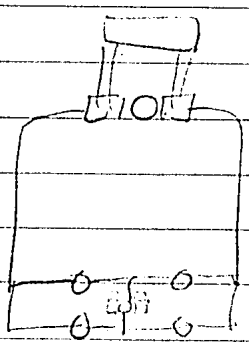


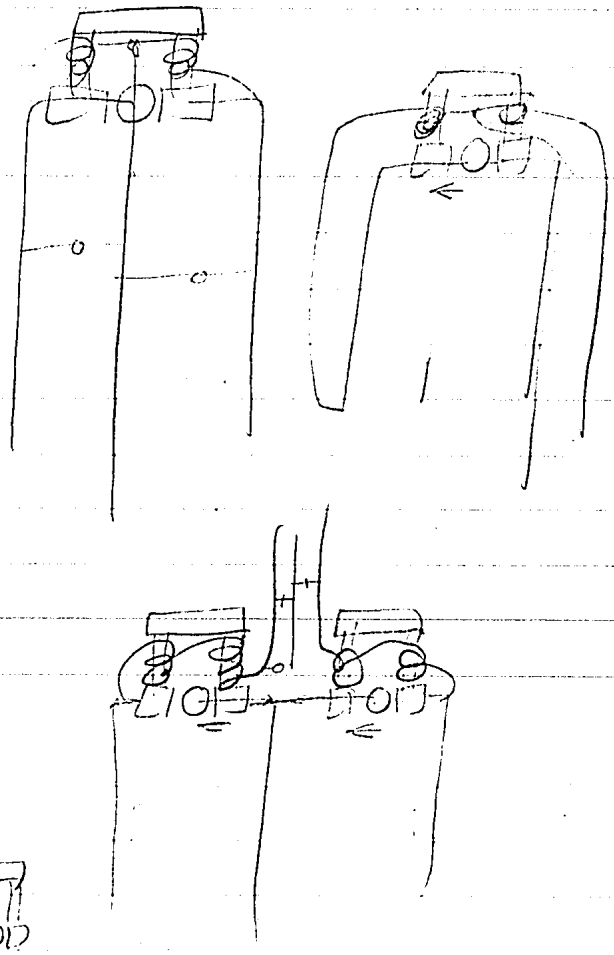


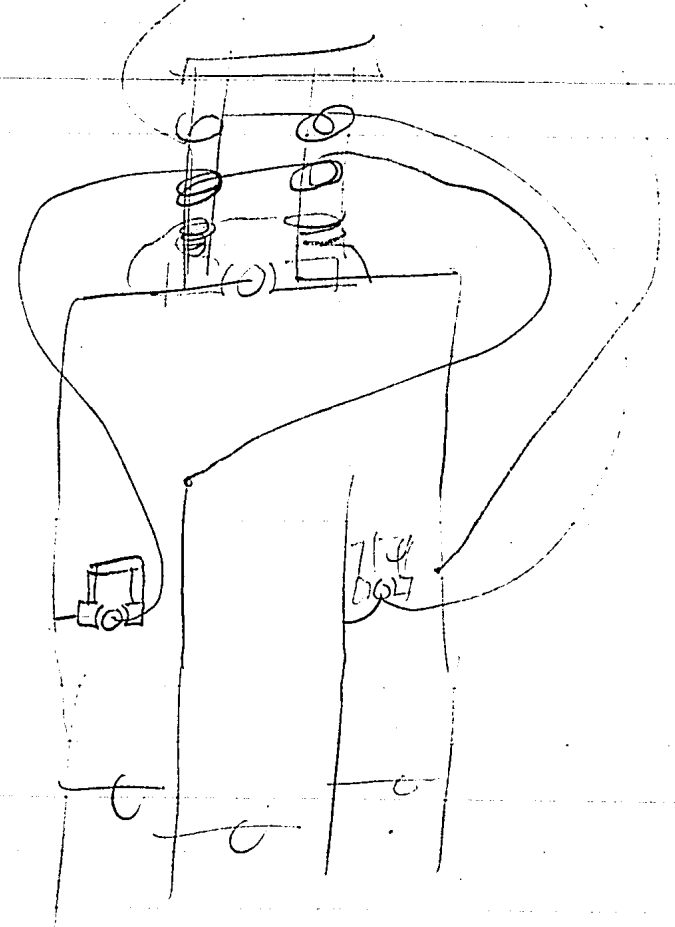


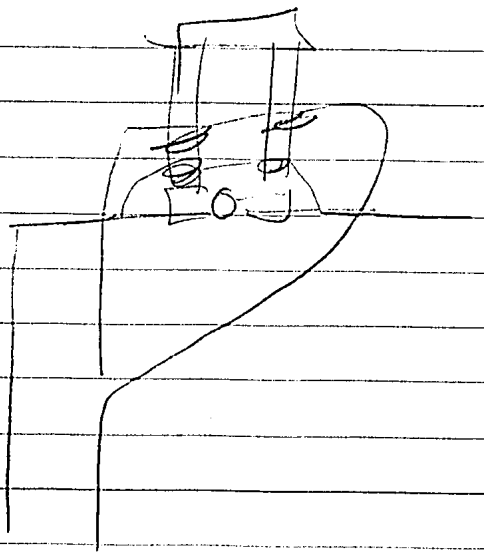


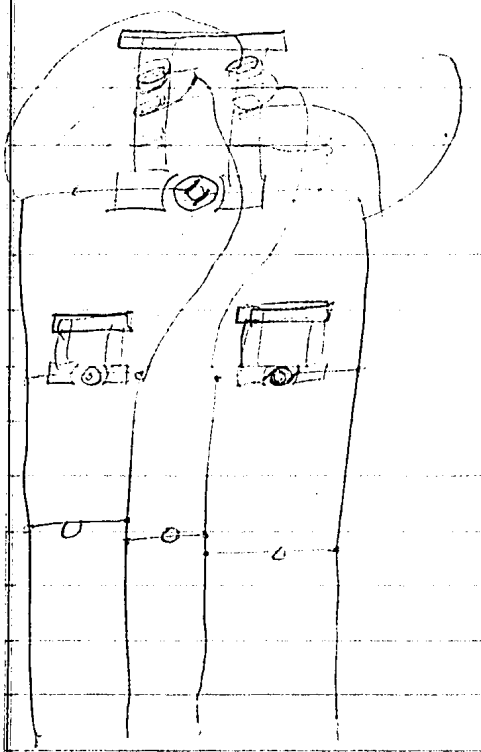


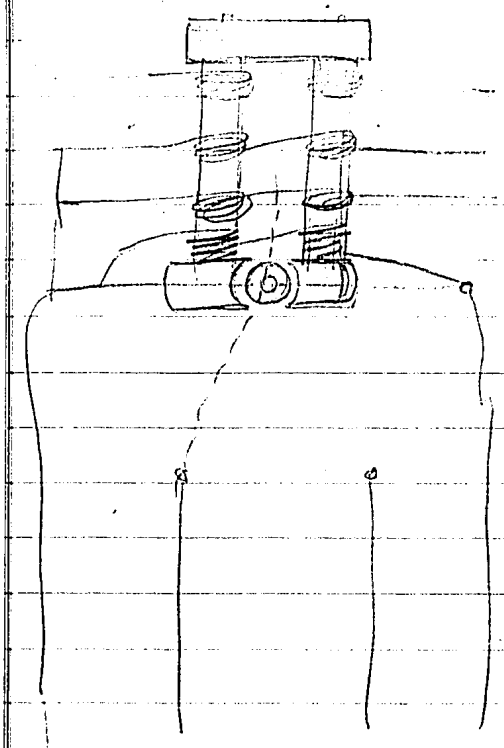


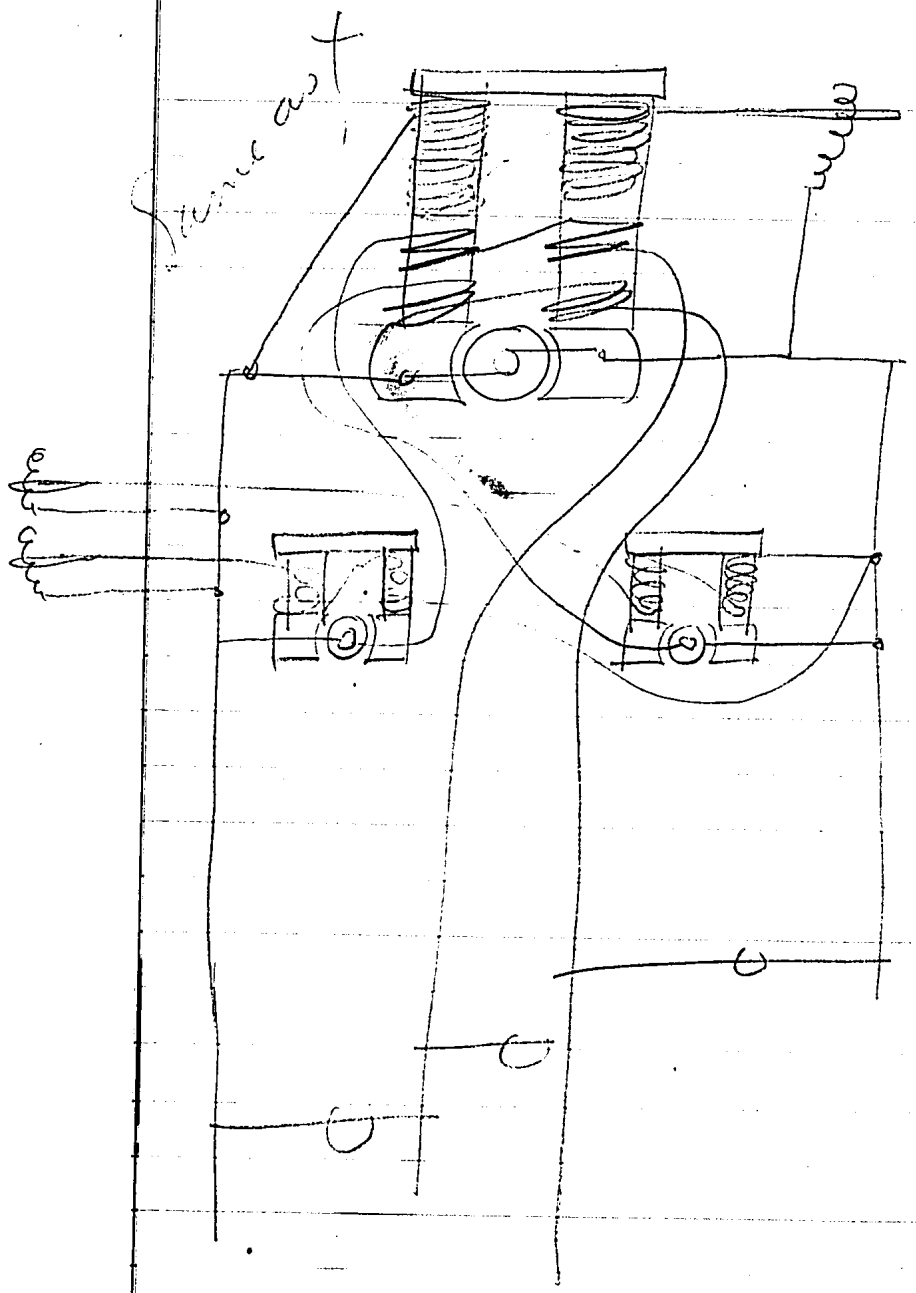


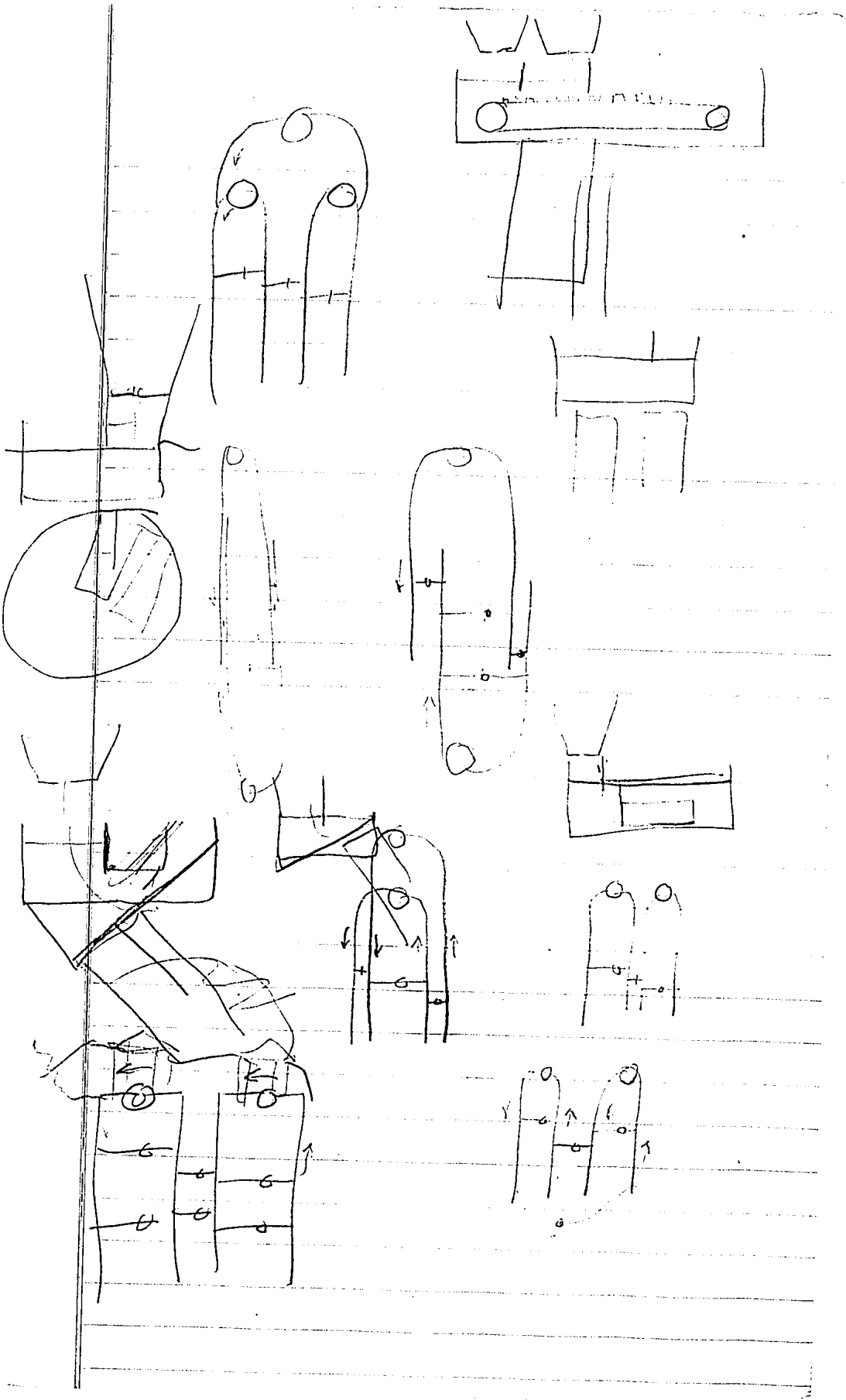












4 inches

40.
20000
60000

300/5000 (16.
300 20
2000 36.
1800
2000 25-
61-

75
20000
$1,500,000.

150
28
200
100

30000

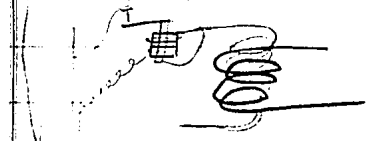
14 times -
4
46.

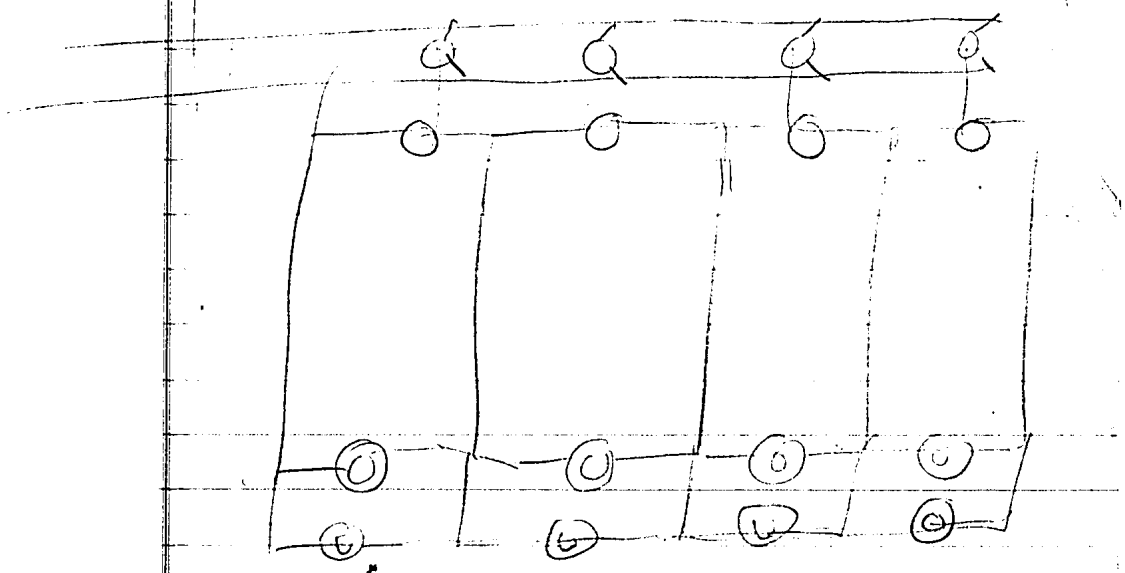
7
4
28 times 5 L.

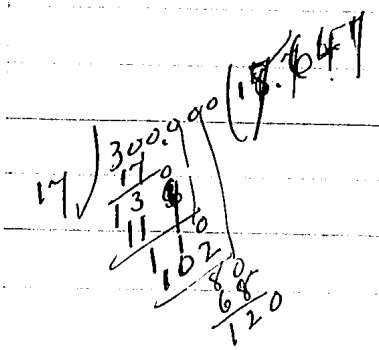
336.
340
1344
9084
10424

85
72-
60

140
168
2
336.







6000 [illegible]
3

118

6000 — 17 [illegible] 17/100
3000
1500 —
750 — [illegible]

30 million 17 mil. 17 pd
7,550 000 5-5 = 17
1,888 000 4·25 —
472 000 2·125
117 000 1 mile 17 pdt

10 000 hp — 5 8 6 2 0 — 8

117

500 watt amp per hp —

10000 amps.

28000.
14
112000
28000
392000

44
500
3520

44/1000

4400
1000
33000 / 2400000 ( 135
33000
110000
99000

26
60
1560

26000
14
104000
26000
364000

268.435.456 CHU / 135

100 volts, 1000
200 500
400 250
500 125

125 - amperes

804 bottles #12 125 amp

2 15000 feet.

10
15000
5000
0
15000
7500
3750
1875
9375
4687
2344
1172
586
293
146
73
36
18
9
4.5
2.25
1.125
1.562
231
116
058
029
0445

804
15000
2000
40401 / 150
402
306
12

10000 / 40000 / 4

.00% of ohm

or 1/250 of 1 ohm

16.777.216 — 0725
3.355.443.2 — 0362
671.088.64 — 0181
134.217.728 — 0090
26.843.545.6 — 0045

33000 92%
.08 33000
2640,00 2640
30360
30360 15
45540 31800
25806 30360
.08 45540,00
2064,48

25806,00
2064,48
23741,52

23741,52
1899,32
21842,20 1899,3216
.08
1747,37.6

21842,20
1747,37
20094,83

330,00) 20000 (3
990
10000
105
300,00 330,00) 20000 (60 10000
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,60) 500 (833
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197
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60) 200 (2000
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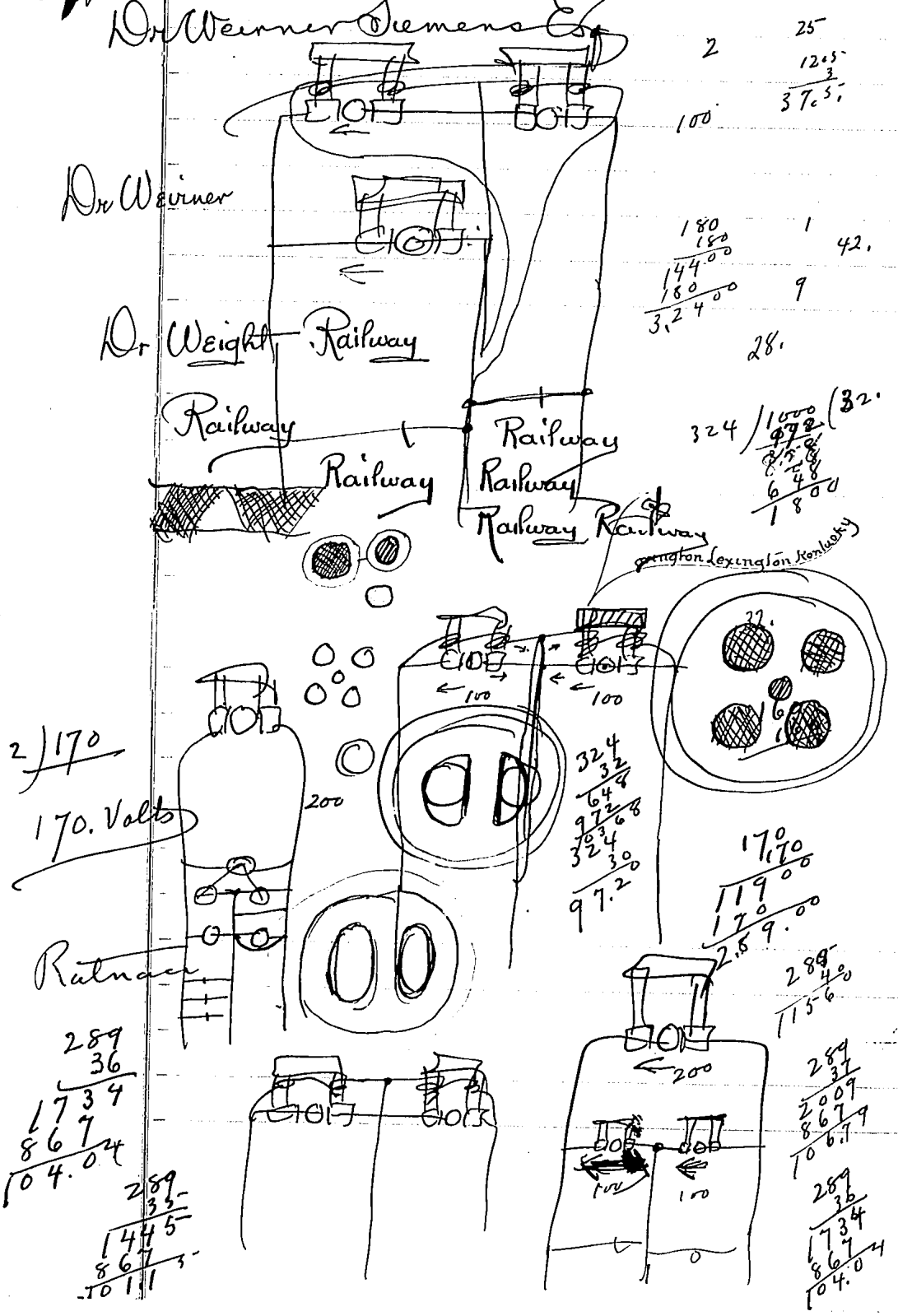
Bu Ex for 20000,

Dr. Werner Siemens Esq

Dr. Werner Siemens Esq

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3
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180
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648
1800

170.
170
1900
119
1700
259.

2/170

170. Volts

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1036
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30
97.2

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1734
867
104.04

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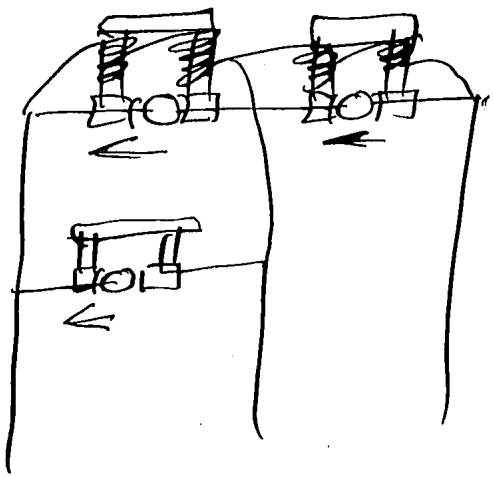
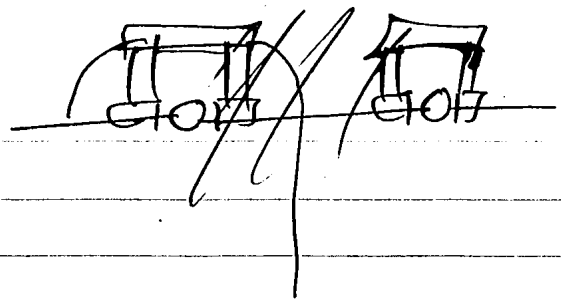
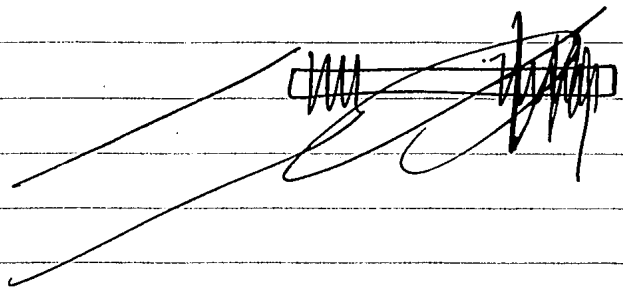
OR







Pencil

NOV 1/87













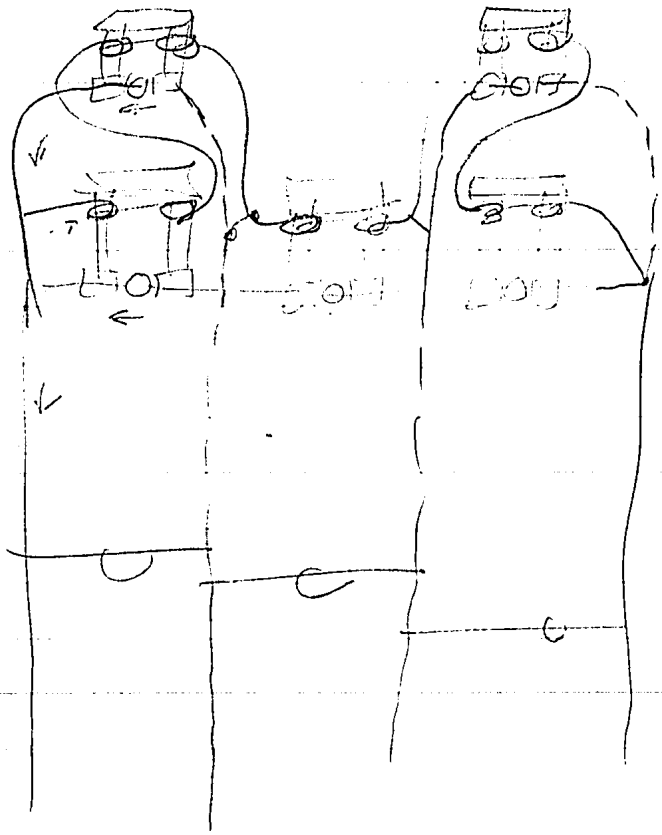


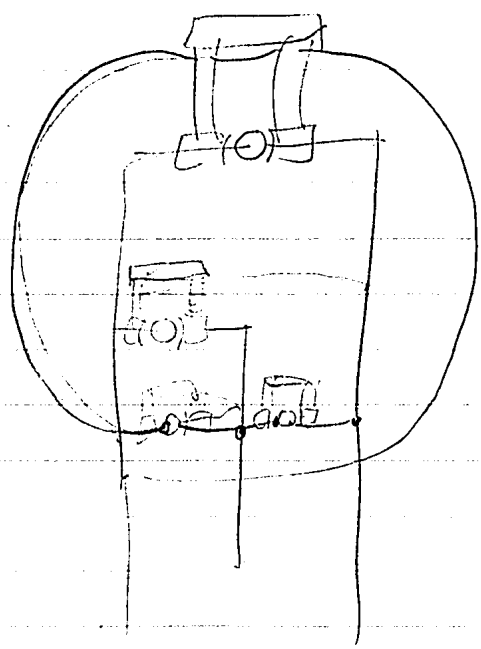


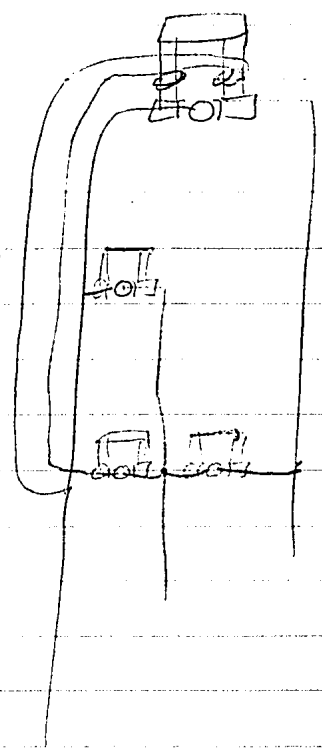


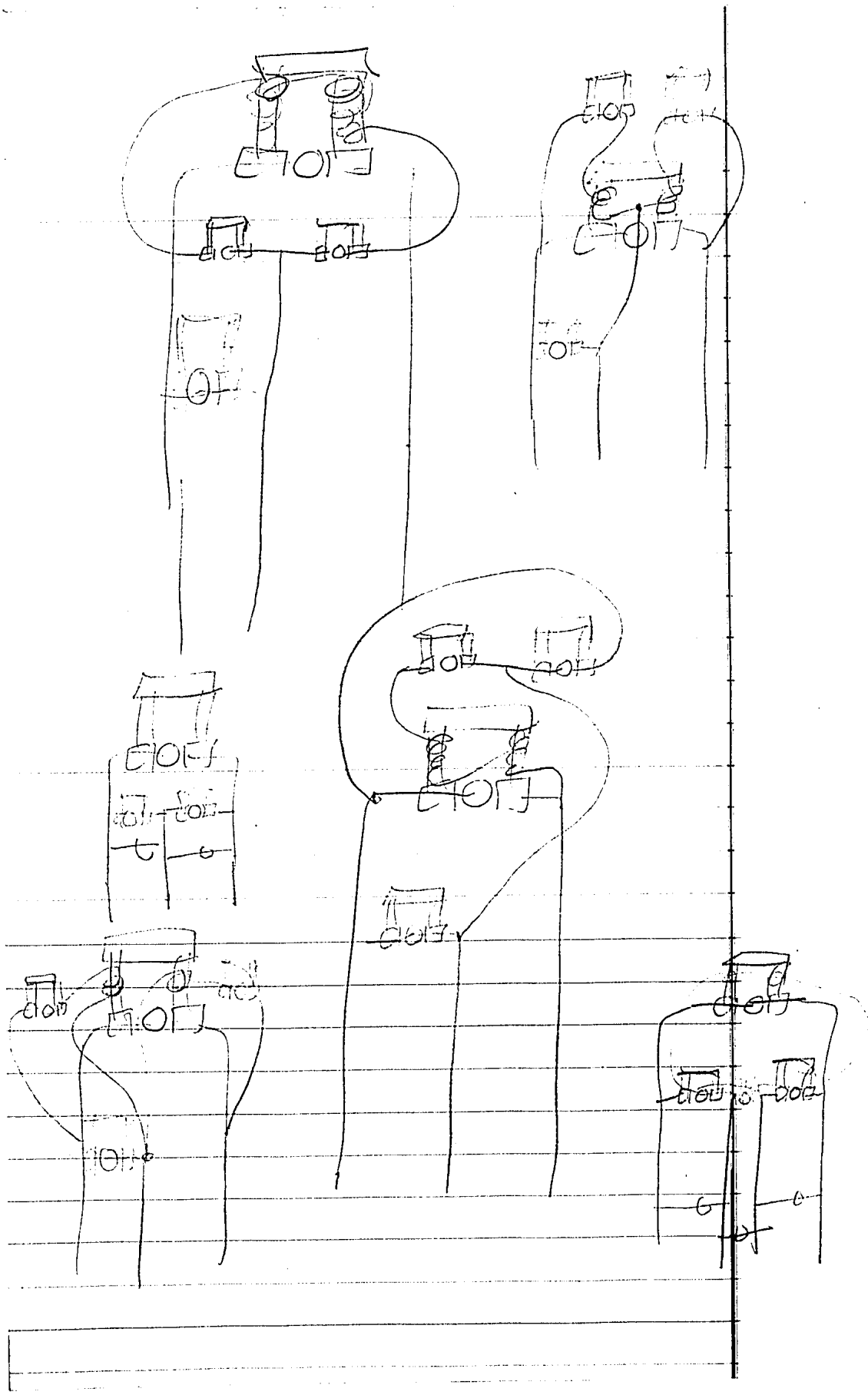
Disabled brake

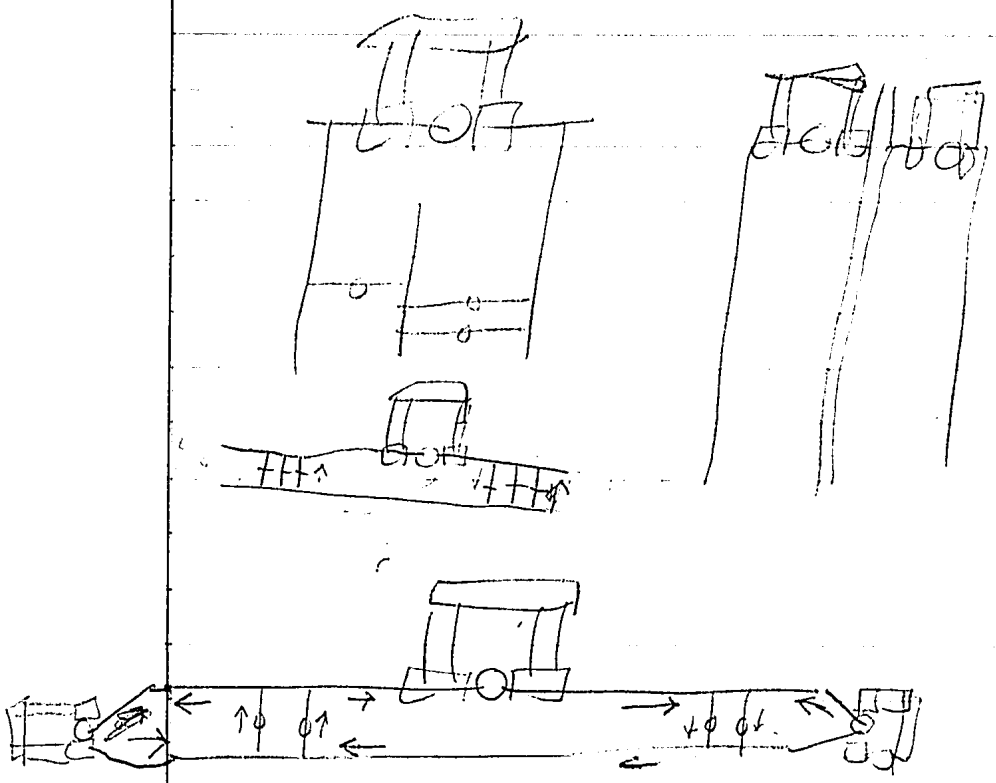
Incomplete drawings











Oct 25 1886

Johnson patent for Elec

Use regular dynamo with regular brushes but they only serve to energize the field which are regulated by the resistance no Lamp current is taken off of these, on the End of the shaft next commutator are two continuous contact disks secured to shaft & insulated from each other surface which is continuous a Gratiot brush rests, both disks are insulated





from each other, & permanently connect one Commutator bar to one disk & the Commutator bar directly opposite on the other side of the Commutator & connect to the other disk Then at every revolution the Current is reversed in the wires leading from the disks ~~which~~ while the regular Commutator brushes take off a continuous Current the two wires connected to the two disk contact brushes pass to a distant point say a mile etc.

There the two primary wires of converters are connected across mains preferably although the can be in series, the secondaries are connected in series to give say 200 volts, the Centre wire being connected to Earth this I take a three wire system, of 2 wire the secondaries are put in Multiple and the high tension Mechanic is say 2000 volts



The Converters have large masses of iron in the form of fine wire core or sheet, hence the slow reversals will not show in lamp, but perhaps if not necessary you need not vary as fast about the way half or quarter second defeat of slow reversals, I intend to confine myself to using this machine in connection with converters as the lamps may be put on direct the tension being reduced of course to the regular

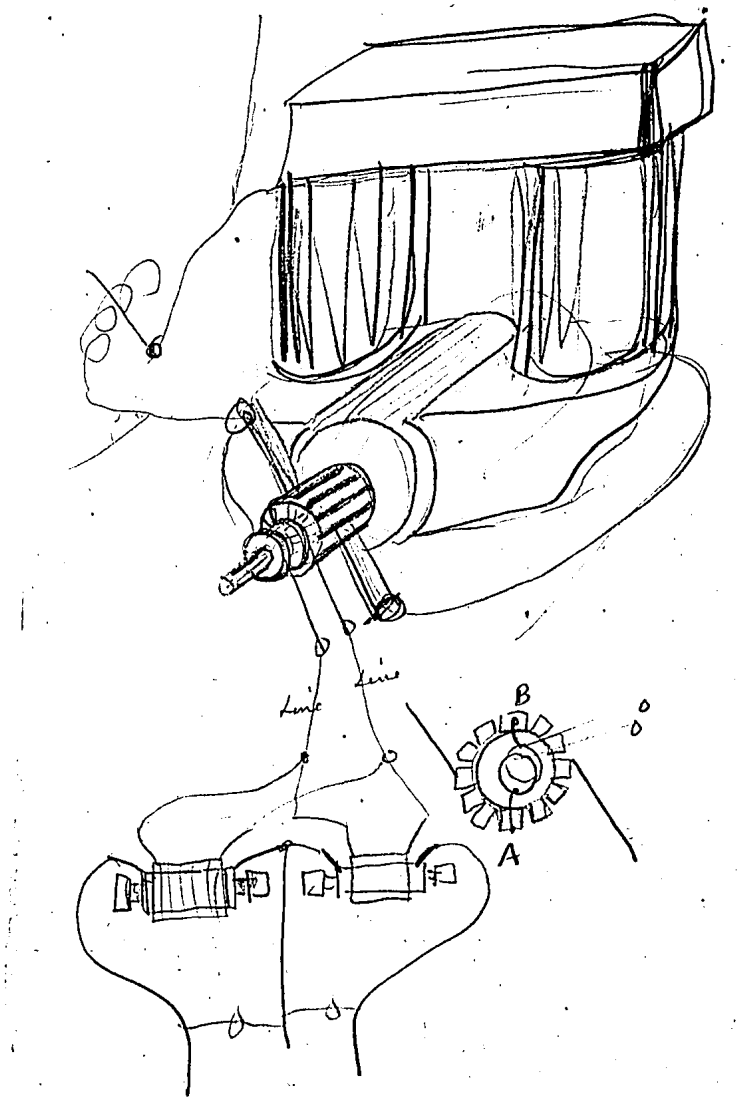
— October — 1886



required Volts,

also I can in addition to putting on Lamps on the service circuit or when using the Circuit put Lamps on the regular brush circuit —

Yours Truly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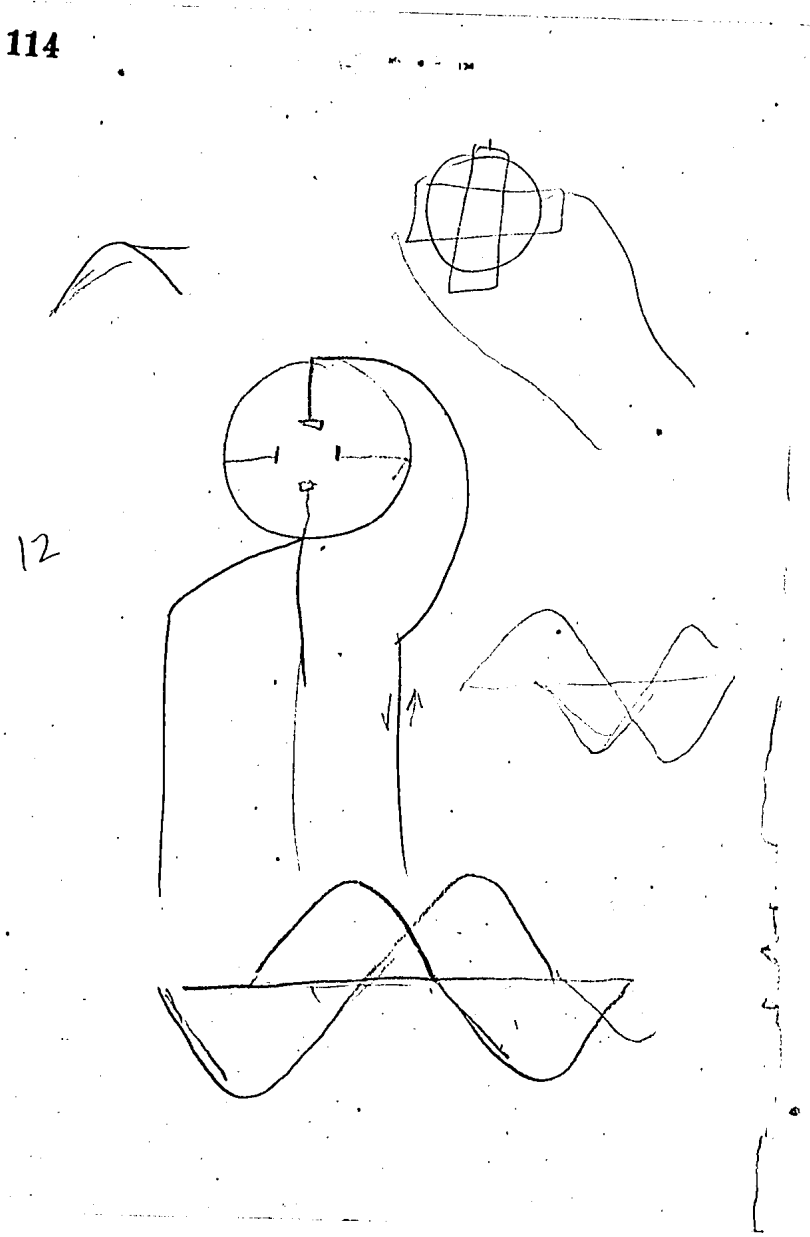
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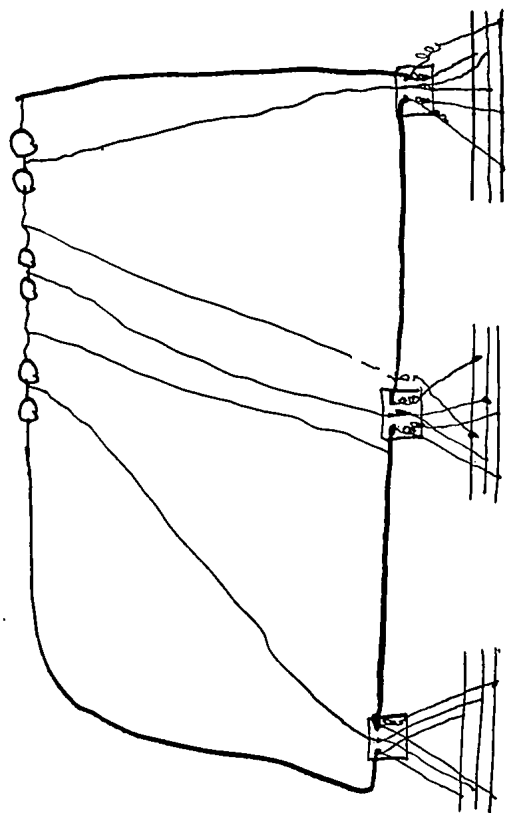
LAW OFFICES OF
DYER & SEELY,
(PATENT BUSINESS EXCLUSIVELY)

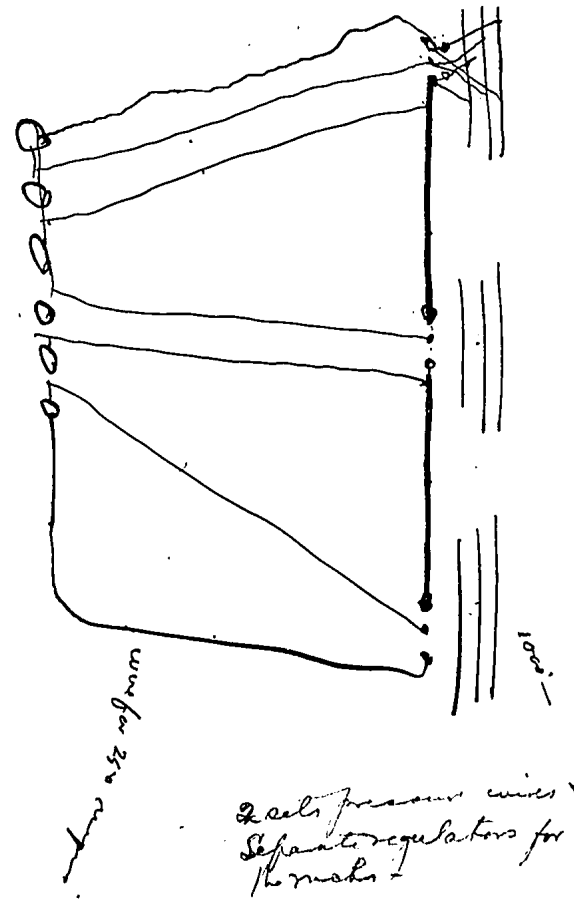
40 Wall Street,
New York, Nov. 1 1886



November - 1886

LAW OFFICES OF
DYER & SEELY,
(PATENT BUSINESS EXCLUSIVELY)

Rich'd N. Dyer
140 Wall Street,
New York, Nov 1 1886



November - 1886 —

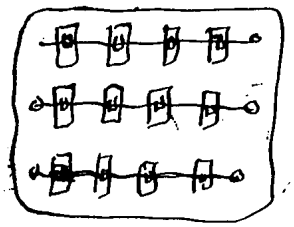
THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Form L. 1200-2-13-'80.

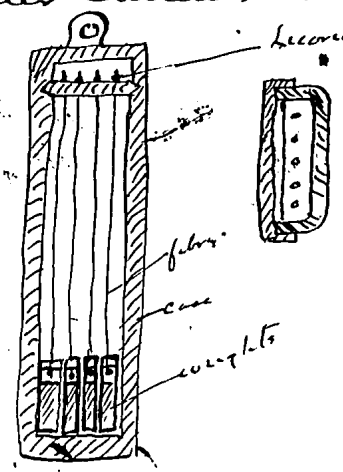
New York, ..... 188 •

The object of this invention is to produce a filament of Carbon which shall have an even Carbonization and not become distorted when Electrically heated.

The invention consists in so arranging the filaments that Each shall be heated Equally on all sides simultaneously directly by radiation and air Currents, or indirectly by being placed in receptacles which shall be heated by air currents & radiation.



Mould
Hung full of boxes

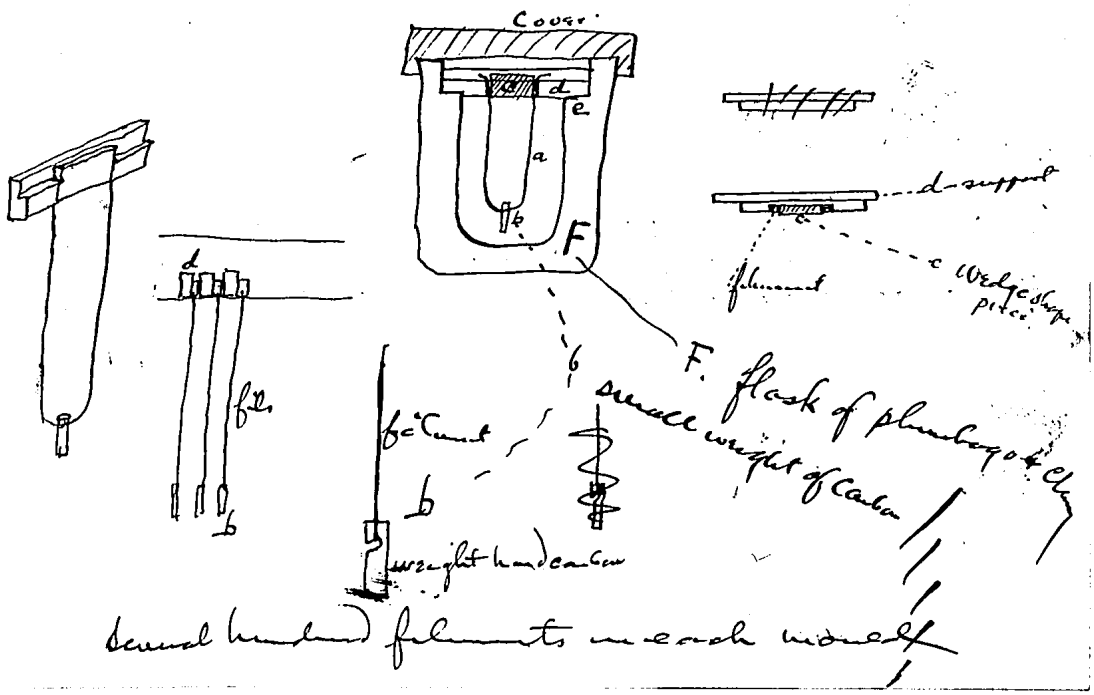


Form L. 1200-2-13-'86.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

New York, Nov 1 188[illegible]

The object of this invention is to ~~obtain~~ Carbonize filaments for incandescent Electric lamps which will be of even resistance and will not become distorted while heated Electrically while in the lamps ~~and will be in a better~~ ~~condition for use in the class of lamps~~ ~~The invention consists in Carbonizing the filament~~ entirely by radiated heat and not by conduction, The filament is suspended out of contact with any body in a carbonizing Chamber a small weight serves to keep it from distorting while being Carbonized thus preserving the shape originally given to the Carbonized filament,



THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Form L. 1200-2-13-'80.

2 New York, ..... 188

Soak the patent, make broadest claims'

Claim. Carbonizing carbonizable filaments by radiated + connected heat. ——

Out of contact so no heat is conveyed to filament by Conduction —

Suspended filament, bent or formed to shape originally + placed under strain while being carbonized to make it hold its shape' — —

P.S. The filament used in Lamp is broken off about 1/4 inch from point of suspension so that it will be carbonized by radiation at the point and not by Conduction from the support, — all Carbonization heretofore of every part of the filament was in contact with matter at some of its parts — our carbon is without exception pure powdered Charcoal, T.A.E.

Where are the other applications ??

Nov 16 1886

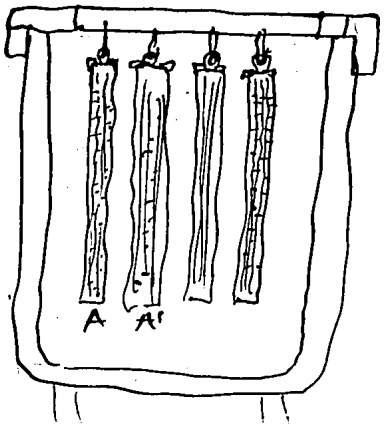
The object of this invention is to Carbonize Carbonizable filament for Incandescent Lamps which shall have an even Carbonization + not become distorted when heated Electrically when Exhausting the globe of the lamp and also to make a better + more homogenous filament

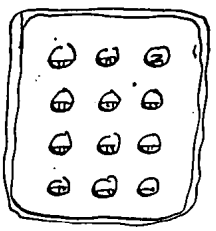
A Many Carbon cylinders or boxes round or flat etc which straight filaments are placed + then packed with powdered anthracite Coal or other form of Carbon — of good heat Conductivity, or even a metal ~~or charcoal~~ or other material which will not be fused at a high heat such as Corundum Silica Etc, These boxes are rather small + contain only a dozen or so filaments The tubes are suspended by Carbon or other infusible hook + out of contact with Each other so they are heated by air Convection Current + radiation thus making an equal heat These tubes being suspended in a plumbago mould this mould in its turn is placed in another similar mould with air spaces, The outer mould receives the flame + heat the inner mould mostly by convection of air Current + radiation thus the second mould receives an even + equal heat.

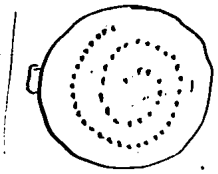
Claim — Carbonizing filaments by radiation + convection Current —

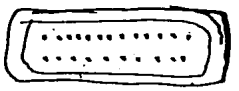
— The double box —

N° of small suspended cylinders boxes etc with sufficient space so they are heated by Convection + radiation without Conduction — etc

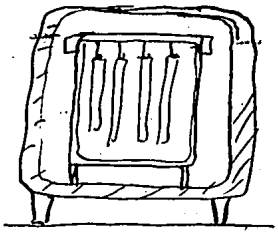





2 sections of tube



November —1886—

Nov 16 1886 —

Seeley —

This is the new system only thing want to Patent on this is, The use of an extra high tension main between the several stations so that in case of a break down on the main from the Central or Steam station or in case repair the station can be supplied from 1 or more stations by means of these break down mains. —

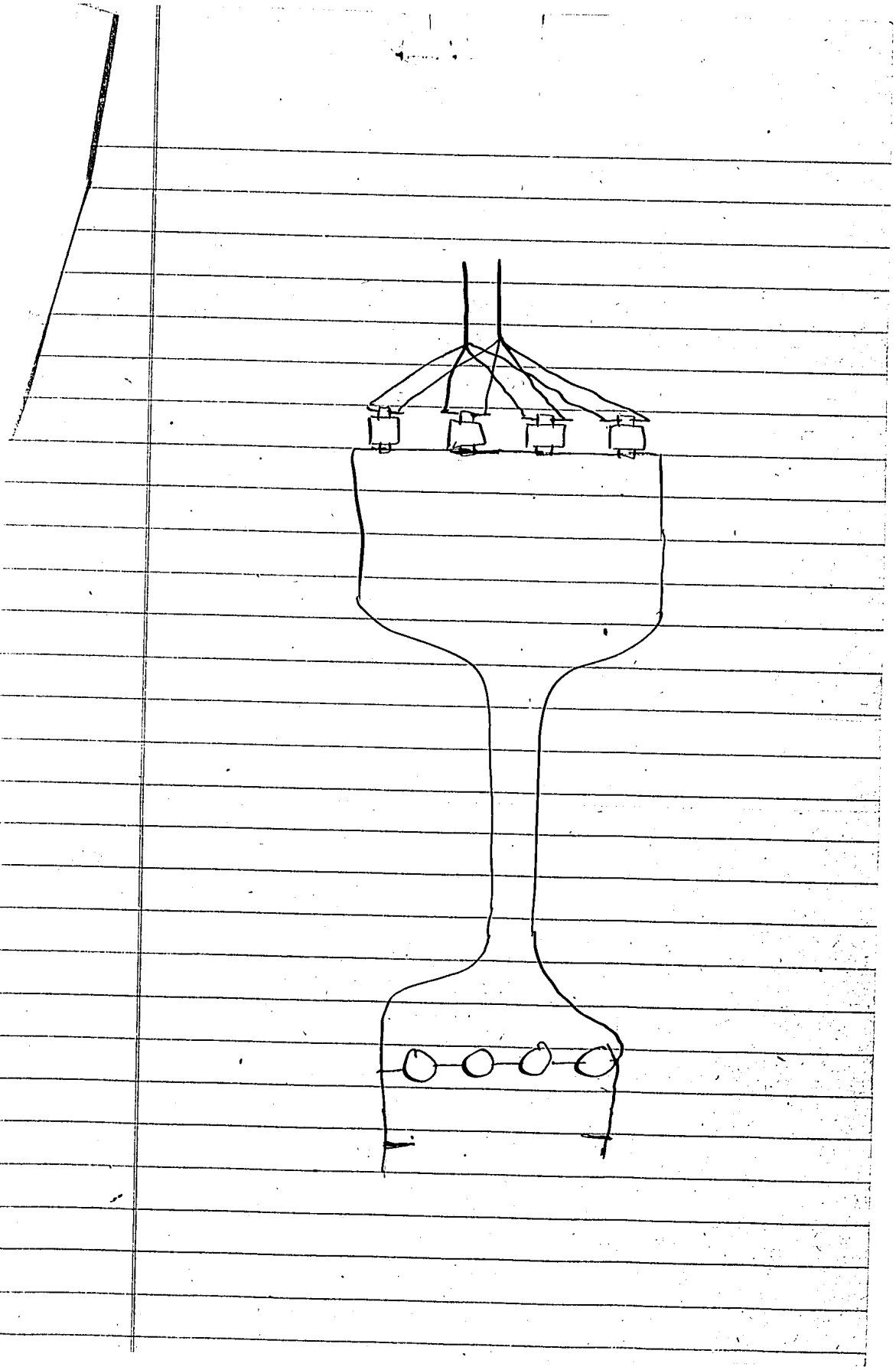
Also means of throwing the system of Dynamos at the steam station in Multiple arc (2 wire) with any other system, where say 3 stations use the same volt lamps they can all be thrown on one set Dynamos + Engines during the Day for decreased consumption.

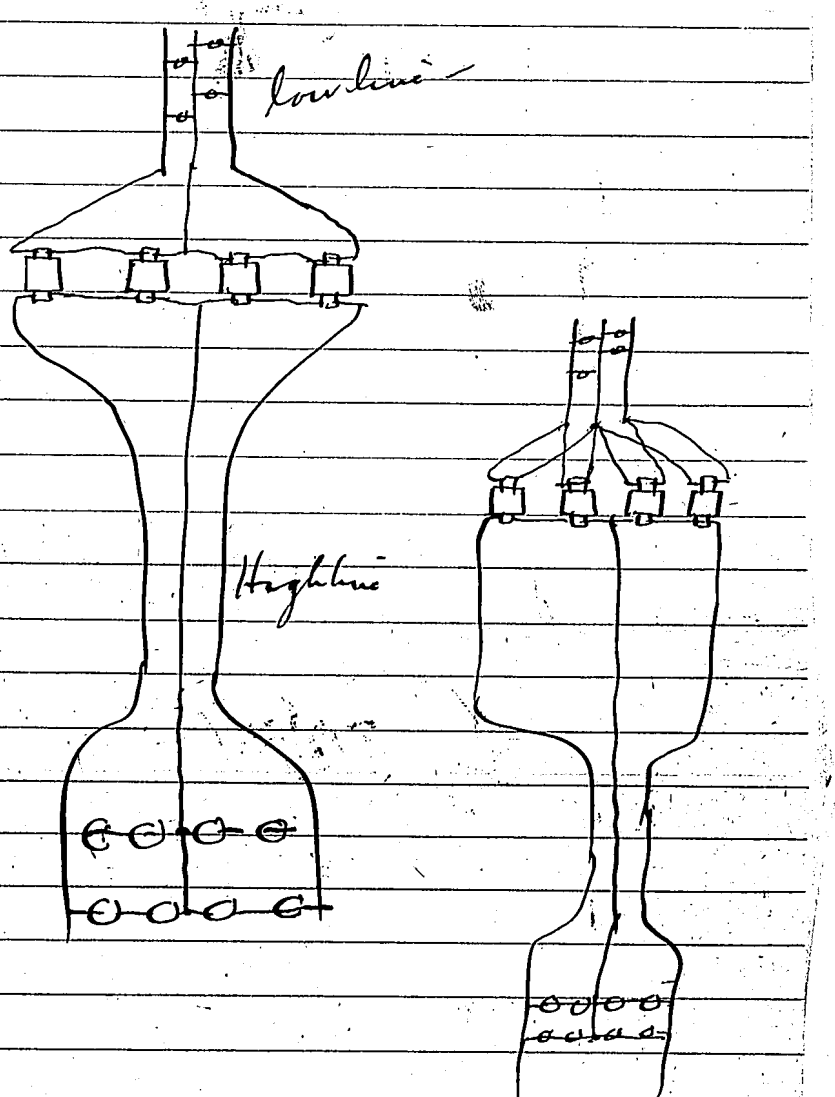
E.

Seeley — N 9ZO 1886 —

Here is some variations for a patent =
Converters in series on high line + other
or low coils multiple circ Etc
you will Comprehend

Tar




low line
high line

The object of this invention is to obtain homogenous Carbon filaments for incandescent Electric Lamps.
The invention consists in the use of the non volatile residues of the resins and bitumens which are Oxygenated Hydrocarbons, With or without infusible conducting or non conducting elements or Compounds.
The invention further consists in the manner of forming the Carbonizable filament and in the manner of carbonizing the same,



"of the Oxygenized residues of Resins and bitumens I prefer what is known as Asphaltene which is prepared from common refined Asphalt by heating the same at about 250 centigrade in the open air until the Volatile matters are driven off - This is allowed to cool & is then broken up and very finely powdered, it is then put into a mould with a plunger from the mould there is a fine orifice through which the

Asphaltene may be forced into a thin filament the mould being heated to the softening point of the asphaltum, - The filaments are then hung in small Carbon boxes a number of which are placed in a Chamber of Carbon. The whole is heated for about 15 hours to a heat a little below the softening point until just before the valuable matters are driven off + then the heat may be



raised slowly without melting or softening the filament until the whole is thoroughly Carbonized -

If the asphaltene just before all the valuable matters are driven off in it preparation is mixed with pure finely divided graphite. + then allowed to cool ~~sprinkles~~ pieces may be put into the filament forming pieces without powdering + by a high heat filament formed out

In this case the filaments may be carbonized by the regular methods without previous drying slowly as the Graphite filaments the ~~filaments~~ liquids of carbon of the asphaltene, ~~oxides~~ infusible oxides such as lime, magnesia alumina may be substituted for graphite where high resistance filaments are required.

I do not wish to confine myself to asphaltine as it is not an exact compound but claim generally the



heating of all Bituminous & Resinous substances until nearly the whole of their volatile Constituents are driven off stopping the heat just below the Carbonizing or decomposing points. petroleum, Rosin etc may be used —

If filaments are formed out of infusible oxides. They may afterwards be impregnated with asphaltene ~~impregnate~~ accomplish the same purpose The asphaltene being dissolved in Benzol or other good Solvent which is volatile at low temperatures

Seeley—

2 find asphaltene the best substance for impregnating the clay plumb— you may have to divide the application as to for soaking How would it do to put all the claims in & then when we want to can make a division—

Claim formation of plumbs from asphaltene or equivalent substance

2nd Combined with powdered carbon or graphite

3rd Combined with infusible conductors



previously formed plumbs of carbon or infusible non-conducting materials impregnated with asphaltene in proper solvent,

Etc

Nov 21 1885

Tues

707

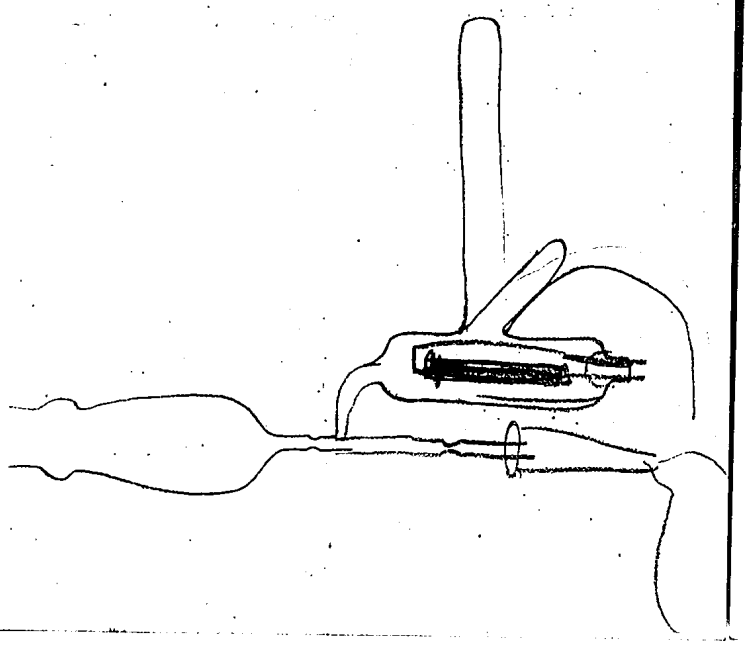
The object of this invention is to make filaments of carbon for incandescent electric lamps which shall be of even texture & of high electrical resistance.

The invention consists of the method of forming the carbonizable filament, by first taking a filament of some substance which is soluble in liquids which do not act on the carbonizable material to be placed on the support for instance Boric acid can be drawn out when hot into very fine perfectly cylindrical filaments. If these be bent in proper form they may be coated with many concentric layers of carbonizable material, for instance if the Boric acid filament be immersed in a solution of Asphaltene in Benzol, once & then allowed to dry which it does quickly it may again be immersed & a second coat put on - each coat



can be made exceedingly thin according to the dilution of the solution after a sufficient thickness of carbonizable material is obtained the whole is thrown into water which dissolves the Boric acid & leaves the filament of asphaltene with a hole in the center ready for carbonization, as the hole in the center maintains the resistance of the filament a saving in conductors is obtained owing to the great number of concentric layers any defect in one layer is rendered a small factor. It is evident that if tubes of Boric acid be heated and drawn out into filament the will be hollow & if the liquid containing the asphaltene be drawn through at intervals it will deposit on the inside of the glass tube - In this case the Boric acid is

over





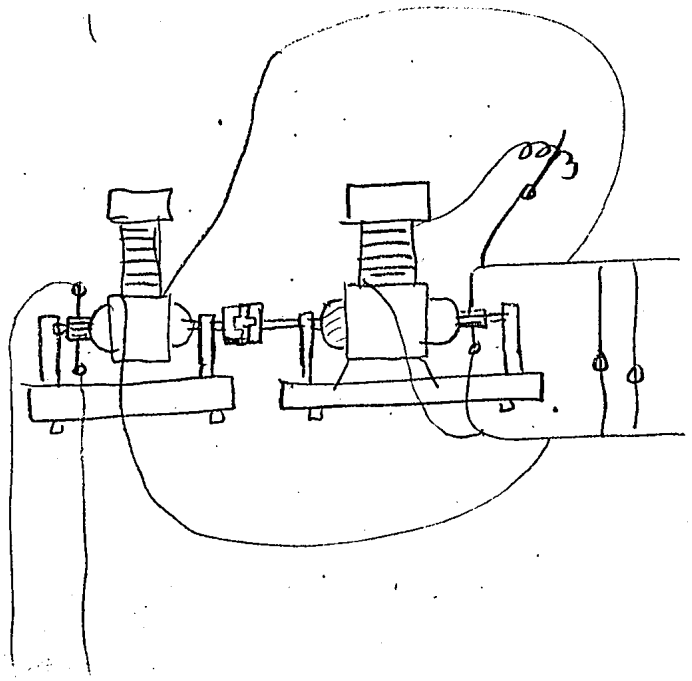
dissolved very much quicker
I have spoken of Boric acid as a former + Asphaltene as the Carbonyzable material, but it is evident that these materials can be changed in almost Endless ways -
If melted Rosin be drawn out into filament, It may be coated with layers of Licorice dissolved into, qhm Dextrine starch, Tragacanth, Arabec, then if thrown into spirits Turpentine The Rosin may be dissolved out,
It is not even necessary to dissolve the Rosin out as the whole is Carbonizable, ~~Still, [illegible] etc~~ ~~All [illegible]~~ all that is necessary is that there should be a smooth substance carbonyzable or salvable on which to

build up the main portion of the
fabric by successive Concentric
films of the material the solvent
of which Volatilizes,

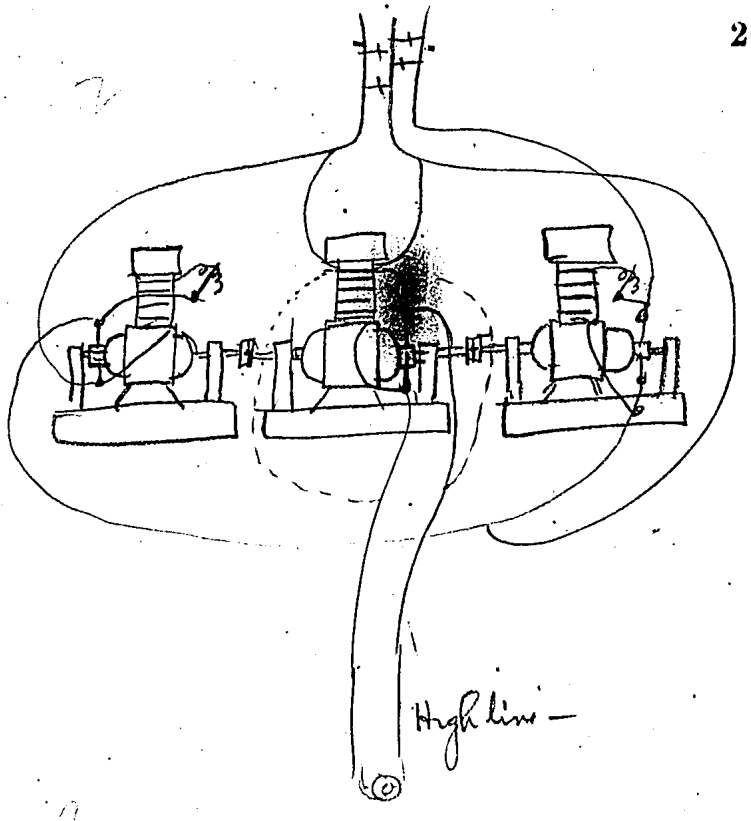
Now friend Seeley can you
get a broad claim to this
process — Concentric Multiple layers
by Low-Carbon — dissolvable former or
Carbonyatte m — Etc Etc,

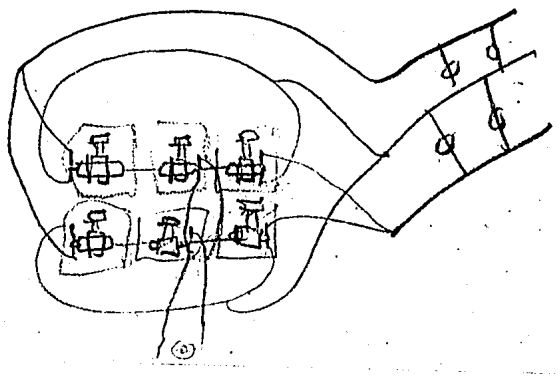
NOV 21 1886

T.A.E






Highline



Dec 17 1886 T.A.C

Deeley —

Want to get all the claims possible on this method of working from high to low Currents. Be careful in drawing patent not to call this a Potential reducer. — It is a motor system driving a Dynamo mechanically make this distinction broad. So they cannot create system + Perry's adverse suggestion of Motors driving dynamos as a Current reducer —

The fifth of the invention is 1st — a motor worked by high Electromotive force driving by direct connection a Dynamo giving out low Volts.



2nd Insulating joints in shaft or means so that the high line is absolutely insulated from the low line. + arranged so that no cross Current can occur — The Earth intervening would in case the wire of one armature Came in Contact with the base prevent any Emf from Entering the 2nd ckt in fact the circuits could be miles apart as far as crossing is concerned. (see 5)

3rd. Placing the Motors in Multiple arc — or string Chain — or on 3 wire

~~[illegible] motor drive~~ —

System which is practically
One thing —

4th - Arranging one motor
to drive two machines as
well as one - ~~Does~~ This gives
a 3 wire unit) —

5th = Energizing the fields
from the dynamos ~~Each~~
and Motor from the low
Current,

6th also Energizing the Motor
field from its own ckt
Dick will tell you what
I want to put this patent in
for — E

Decleq —

Nov 26 1886

The object of this invention is to ~~d~~ increase the quantity of iron in the rotating armature of a dynamo machine or rotating Converter and at the same time not increase the ~~strength~~ of the Foucault Currents —

The iron — Heretofore the iron plates which make up the core have been separately paper

The invention consists in Coating each plate by a varnish which will not shrink or crack at a high temperature

~~Except~~ which shall be a good insulator of Electricity and a good Conductor of heat so as to allow the heat to be rapidly Conducted to the surface —

After the plates have been stamped out & the burs taken off they are dipped in a hot solution of Asphalt or Asphaltene in Turpentine Benzol or other Volatile Solvent The film dries almost instantly is exceedingly tough stands a high temperature & ~~must~~ may be safely reduced to 1/3000 of an inch thick

The plates are all assembled
on the shaft and by means of
bolts are gradually brought
in intimate contact while
the armature is in a hot
Chamber. The heat serving
to drive off all traces of
the Solvent used. The
film left will sustain
a heat of over 400 degrees
Fahr without softening or
running out of the plates
and sufficient tough to
prevent any burrs from
being forced through it,
so as to make Electrical
Contact with the adjacent

plates – ~~The method of~~
~~the destillation of petrolatum~~
~~from~~ almost all of the Bituminous
or partially decomposed Resins
in proper Solvents will
answer but I prefer ordinary
Asphalt boiled to drive
off some of its volatile
Constituents

Claim The method of ~~making~~
Electrical
insulating the iron armature
plates of Dynamos by
Coating them with an
insulating ~~material~~ varnish
The use of Asphalt in proper
Solvent,

Heating armature after
winding ~~to~~ Insulation
etc

# November

Nov 28 1886

Seeley

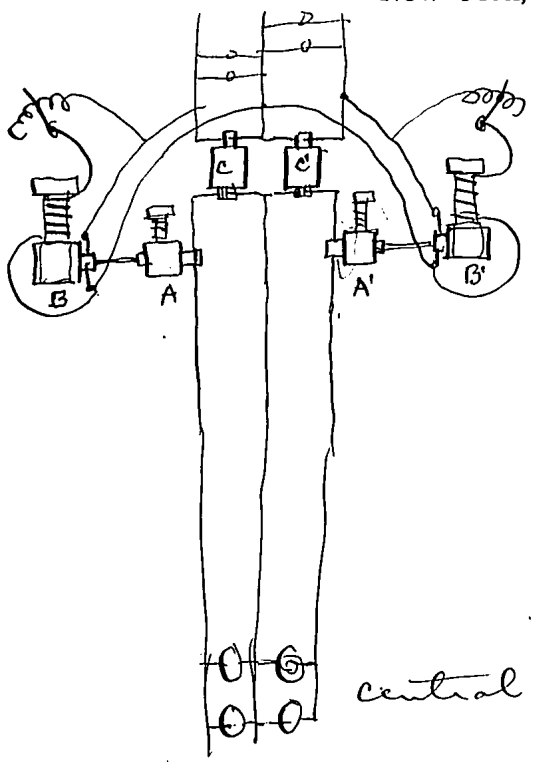
In the future some Westinghouse + Byllsby make seek to evade the Commutator patent by running a dynamo by a motor now if they do it by a belt they might evade the patents as Sprague and Gordon suggested in 1879 — Now I want to cover the only practicable way to do it & in addition connect it to our 3 wire system & so combine it that I can cover it through combination with other Essential features in any system such as feeders, etc —

I send you sketch, but you must making drawing shewing a distributing system feeders, feeder Regs — pressure wire —

The advantages of this system is that one system can be absolutely insulated from the other — an insulating joint between the two machines — also the pressure in the low line can be regulated by varying its field magnet which is not the case in Revolving Commutator, 3rd Direct connection from shaft to shaft of Motor + Dynamo — Workshop fac

THOMAS A. EDISON,
No. 65 Fifth Avenue.

New York, ..... 188




Object of patent regulation of the E.M.f at the reducing station while that at Central station is constant -

A A' are two ~~dynamos~~ Motors wound so that a 1/2 speed they give a minimum Counter Electromotive force

B are Motors which are run from the low tension line, — When the Volts are to be increased or diminished on the high line - the fields of B

Form L. 1200-9-18-'86.

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

2

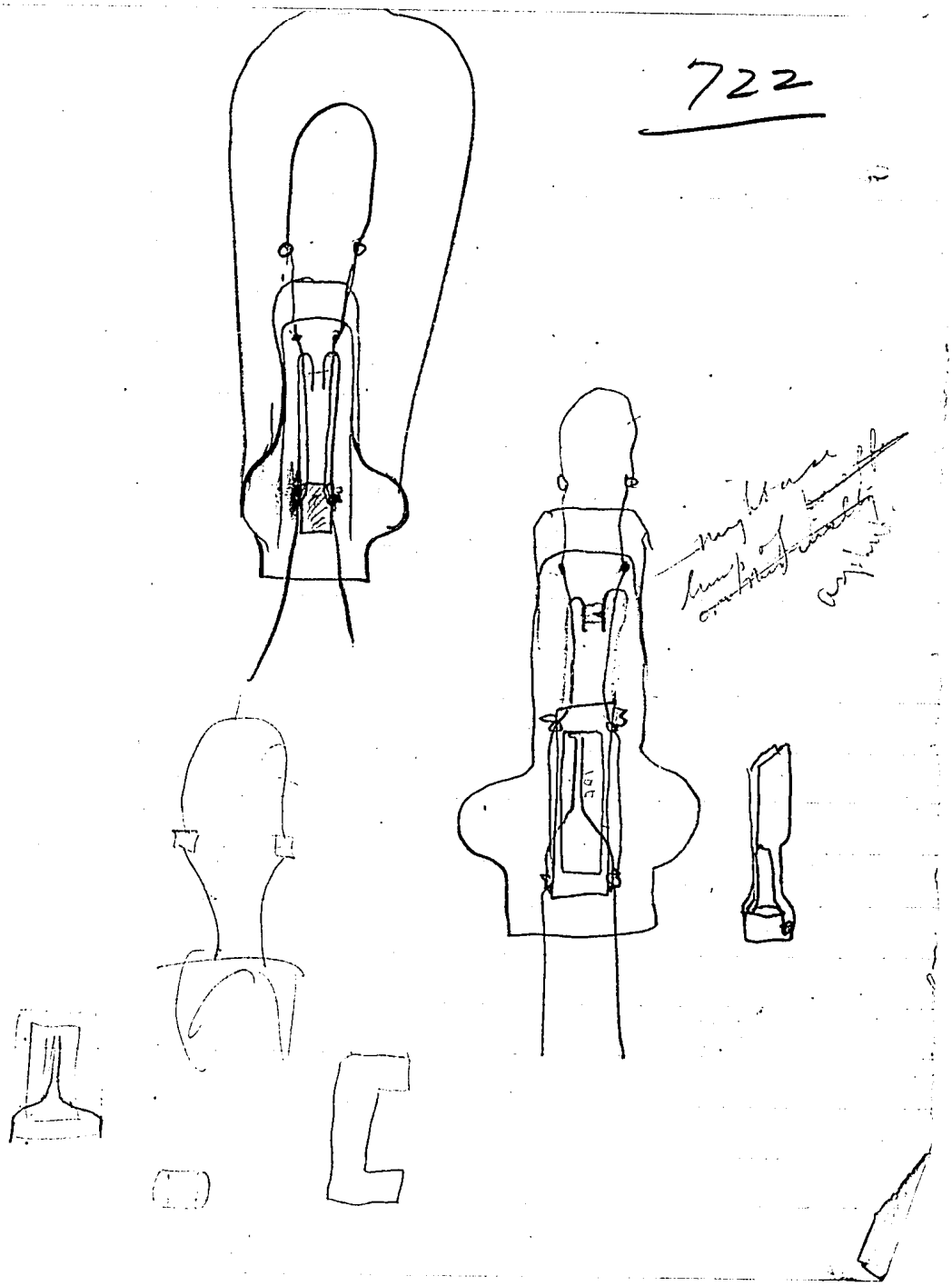
New York, ..... 188

are increased or diminished in strength
& thus the Motor B runs at a higher or lower
speed - thus Causing A to give greater
or lesser Counter EMF or back pressure
Thus if the Central station has a Constant
of 2500 volts & A a Counter pressure of
500 volts, The net will be 2000, if now
there is a fall of pressure due to load
The strength of the field of B is
weaned, the speed of A diminished
& the back pressure diminishes thus
bringing the pressure up to the required
amount,

Nov 29 1886
T A E

Rec. 30 86

722



— Dec 18 1886 —

Patent — Dec 21 86

D. S.

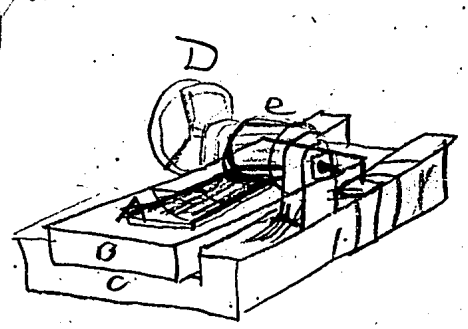
The object of this invention is to produce Mother of pearl surfaces artificially —

The invention consists in forming ~~by~~ ~~[illegible]~~ a flat plate of mother of pearl formed of one or more pieces the whole resting on a hard flat surface.

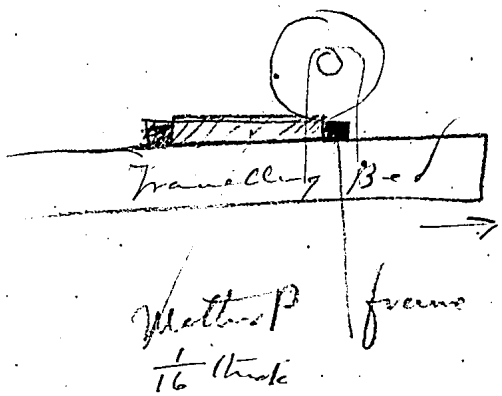
Impressions being taken from the face of the mother of pearl on plastic sheets or material by pressure ~~similar~~ the apparatus used being similar to a Lithographic press —

The colors of mother of pearl being due to minute wavy lines formed by alternate layers of lime & animal matter the depressions between the lines being quite sufficient to cause a perfect impression on the plastic surface of the sheet or material pressed on it I have discovered that not only are the many thousands of lines accurately transferred but that the lime like appearance is transferred as well — If a mirror like sheet of tin foil be impressed on the mother of pearl it will have the exact appearance of the same and its metallic ~~Characters~~ appearance is entirely destroyed Metallic foil, Celluloid ~~but~~ and other plastic materials may be printed as above used for ornamenting

Picture frames fans and in fact take the place of gold foil - Britannia Metal table ware & innumerable other articles can be given a mother pearl surface by this means -




e is the steel roller - B the travelling platten C the frame D the wheel A the Mother pearl in frame — The tin foil being laid on Mpearl block is printed just like lithograph




Can you claim the art of printing from Mother pearl also a new article manufactured Mother pearl surfaces or foil —
The process - ought to get Broad claims and claim to

— December. — 1886 —

new art - [illegible]

Mem — It works splendid — have made machine — it possible to rule fine lines in a wavy manner by diamond tool and a dividing Engine also on steel or other hard metal which will imitate Mpearl - shared you speak of this, & other applan & intend take out another patent on it —

TAE

Bill to me personally

## Technical Scrapbook, Cat. 1152

This scrapbook covers the period May-November 1887. The entries are by Edison. Included are notes and drawings relating to phonographs, ore separators, lamps, electric power distribution and regulation, and the production of wrought iron. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney. The name of Mina Edison appears as a witness on some of the documents. The case number of Edison's patent application has been written on some of the items.

119 May 14 1887 Patent Tag a new process

The object of this invention is to Make wrought iron direct from Molten Cast iron.

The invention consists in running the molten metal into pigs in the sand moved or other receptacle and the ends of which are two iron rods connected to a powerful dynamo Electric machine of sufficient ampere capacity to cause the iron to remain liquid & to boil & remain liquid for such a time as the carbon is mostly burnt or all burnt out, so that nearly pure iron is produced & the Current is taken off the rods pulled & the liquid allowed to Cool. The ends of the bar are slightly larger than the bar itself to prevent the carbon rods from

Melting, to improve the grain & quality & cause the moved to be placed in a powerful magnetic field so that when it is cooling the particles of iron shall be given a directive force, and thus give a grain & toughness to the iron

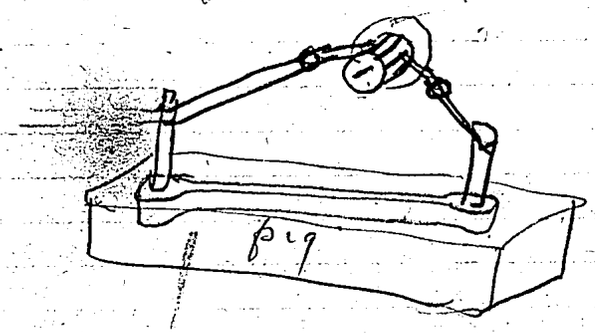
I am aware that Electric Currents have been passed through Molten iron, and I am also aware that Molten iron has been allowed to cool in a magnetic field, but I claim as new the use of a sufficiently powerful Current to maintain such iron in a Molten state for an indefinite time, and also the use of a sufficiently powerful magnetic field as to cause a directive force to be given the particles of iron when nearly set. The new Effect will be produced with the space magnetic lines used

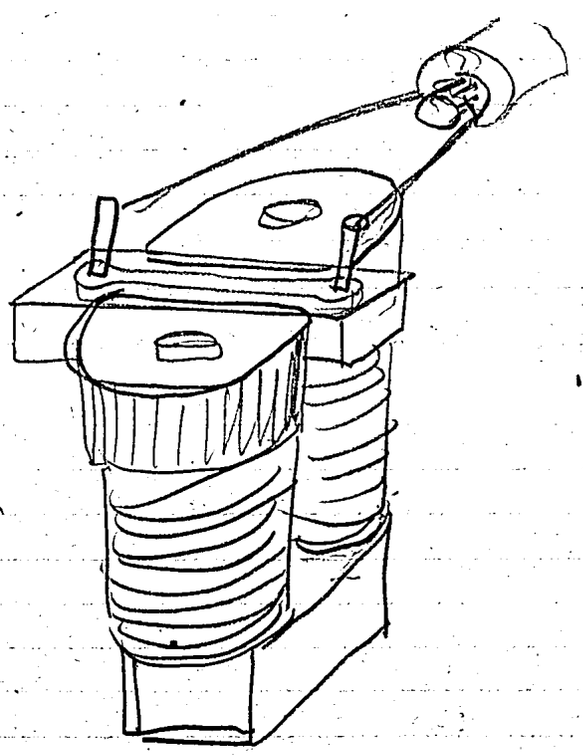
as iron at the moment of hardening from a Martensite has very little magnetic Capacity hence the Excellency powerful magnetic of the large Modern Dynamo machine will alone produce any effect,

Claim, the passing of Current to keep in liquid state,

Claim powerful feed ele·

Claim both in Combination



In replying please address
"The Edison Machine Works."

THOMAS A. EDISON, President.
CHAS. BATCHELOR, Vice-President and Gen'l Mgr.
SAMUEL INSULL, Secretary and Treasurer.
JOHN KRUESI, Assistant Gen'l Mgr.

THE EDISON MACHINE WORKS.

CABLE ADDRESS:
"XYDSUN NEW YORK."

SCHENECTADY, N. Y., _____

Dyer -

Patent -

Improvement in phonographs

The object of the invention is to improve the articulation of the phonograph -

The invention consists of a cylinder of wax compound or other yielding material such as moulded Kaloni. Camphor Naphthalin coated with Tin foil or fulmi. of gelatin or other smooth Extensible materials. so that the surface could be very yielding yet none of the material of the cylinder should be cut away -

The invention further Consists in causing the reproducing point connected directly to the diaphragm to be given motion not by reducing in size of the indentations but by by Etching the articulation between

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2

The ~~point and the~~ Electrified Cylinder or point as the case may be, The point does not come in contact with the moving surface but nevertheless ~~the~~ it will ~~be~~ be given a motion corresponding to Pitch & amplitude of the indentations.

The Electrification of the point or tin foil surface is accomplished by a small disk of hard rubber or glass provided with a rubber ~~or~~ collector - ~~or~~ The disk being turned simultaneously with the phonographic Cylinder. ~~instead~~

~~vacuum~~. ~~The Horse Hair Electrifier of Varley~~
~~Wrap connected instead with Commutator~~
any other Electrifying device may be used

~~Motion~~
The Cylinder of wax or other material is connected to the earth in the usual method in static Electric apparatus.

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The smooth surface of the cylinder is grooved by a grooving tool like a Chaser This is in advance of the recording point ~~of the Recorder~~ The recording point is of chisel shape & indents the apex of the ridge left by the Threading tool - Thus the record extends outward beyond the general surface of the cylinder & is very susceptible to attraction for the point in the receiving diaphragm

claim reproducing from ~~a record~~ phonographic ~~records from records~~ records by electrification of the ~~cylinder~~ record or reproducer or both

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SCHENECTADY, N. Y.,

2nd Reproducing without contact,

3 The Chisel point -

4 — Wax Cylinder of or other yielding material
coated with an Extensible material

5 forming a thread or screw
& recording on the apex of the
ridge between

6 — yielding Cylinder of yielding material, covered with
metallic foil.

Etc — T A E May 21
1887

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# THE EDISON MACHINE WORKS.

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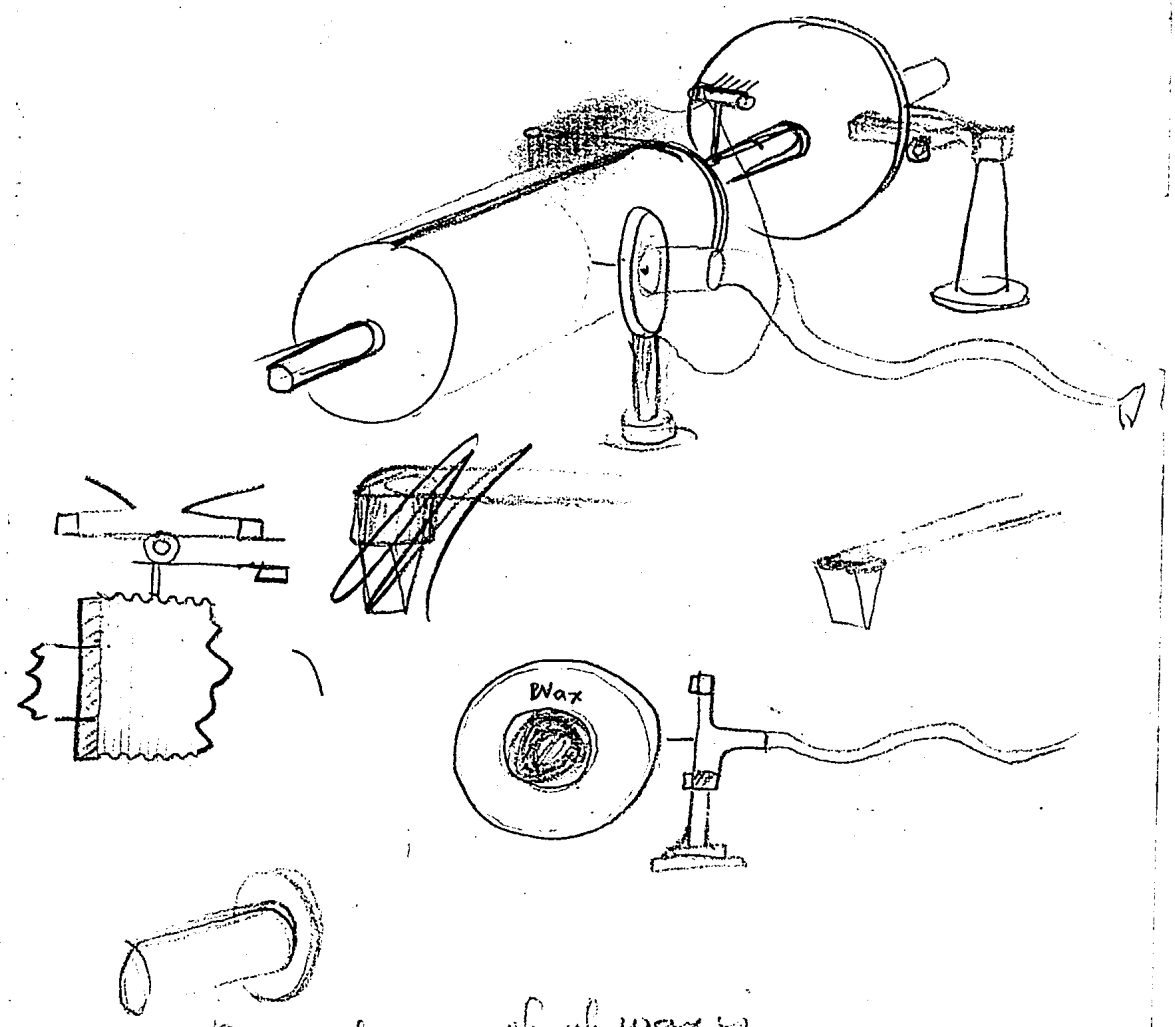
SCHENECTADY, N. Y., _____




Brass sleeve on which wax is
cast mounted as a cylinder.

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THOMAS A. EDISON,

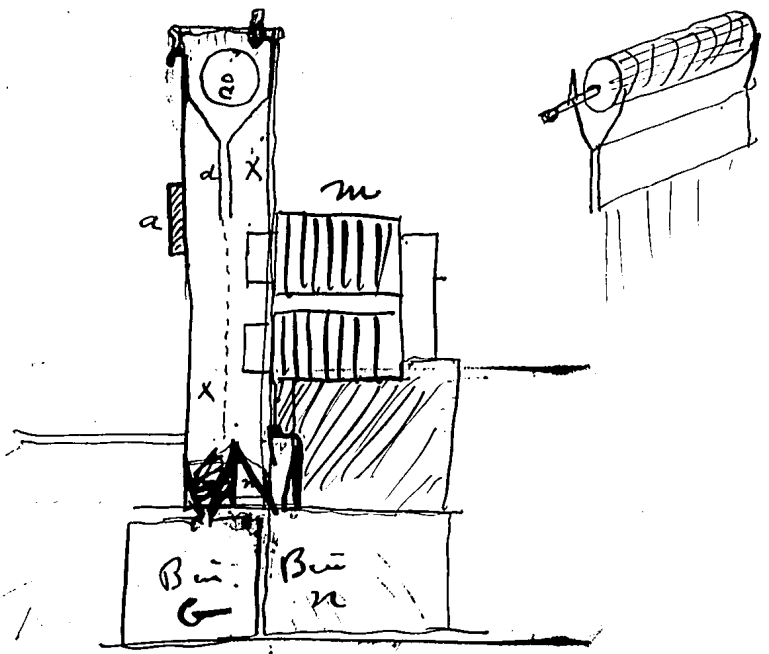
40 & 42 WALL STREET.

725

NEW YORK, _____ 188

Dick –

Patent, Apparatus for ~~Milling ores~~ - Separating ores




X X is a closed chamber to prevent draughts of air from disturbing the perpendicular fall of the fine particles. This chamber which is made of wood in certain instances where the ore has to be ground very fine to liberate the gold

THOMAS A. EDISON,
40 & 42 WALL STREET.

NEW YORK, _____ 188



is provided with gaskets & stuffing boxes and the chamber connected to an ordinary steam Vacuum apparatus the air being continuously Exhausted to 29 inch Column of mercury. the residual air being thus rarified does not appreciably affect the perpendicular fall of the particles unaffected by the magnet, a Bin G receives the gold or non magnetic material & Bin n the magnetic material -

d is a straight fall box C is a revolving cylinder Sieve, the fine particles from which fall into d and in passing downward are given a straight Course before leaving the mouth of d — as this has to be or as better to be placed near the pole of the magnet the magnetic particles in the air are drawn to one side of d & clogg it, but a bar of iron a is placed on the other side of such a mass & an equal

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a position that a Counter attraction ~~of~~ or Balance
is obtained & clogging is prevented.

Claim — Closed chamber

2nd Closed Chamber exhausted

3rd altering trapezium in closed space

4 " " " Vacuous space

5 — straightening fall box d

6 — Gravity a

7 Rotating sieve in closed chamber &c

Etc —

June 24 1887

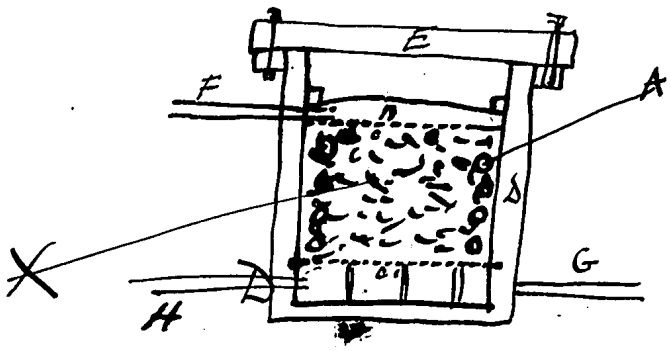
July 1 1887

Dyer-

Patent following-

The object of this invention is to provide an economical and satisfactory process for seperating fibres from the stalk surrounding matter in fibrous plants.

The process consists in packing the stalks stems etc after barking or splitting as the case may be in tanks containing a coil of steam pipe. Then allowing a hydrocarbon to percolate upwards through the mass until the whole is covered with the liquid, The tank being closed. water is passed through the coiled pipes at various temperatures according to the material to be operated upon, for plants containing fibres surrounded by pulpy material like the cotton, The temperature should be about 130 Fahr but for flax &c a temperature of 175 to 180 Fahr. But many very pulpy plants




D is the tank holding a ton or more of material
C' & C are plates perforated C' acting as
false bottom, on this rests the material X
on top of this is another perforated plate
secured to a frame B & by which is mass
of material is pressed down to occupy
smaller space, an inlet pipe G. serves
to force the hydrocarbon upwards through
the material. when the action is finished
we G is shut off & water is forced

through it displacing the Hydrocarbon upwards from the material, the Hydrocarbon is drawn off (through F & run back into the tank connected to G. to be used over again, Time must be given the water to displace the oil so that a very small fraction will be wasted / if care is taken with this respect the oil will perform an almost infinite amount of disintegration thus cheapening the process

Claim process of separated fibres from the plant by steeping in a material insoluble in water –

2nd use of a hydrocarbon –

3 Heat,

4 – displacement,

5 – the apparatus –

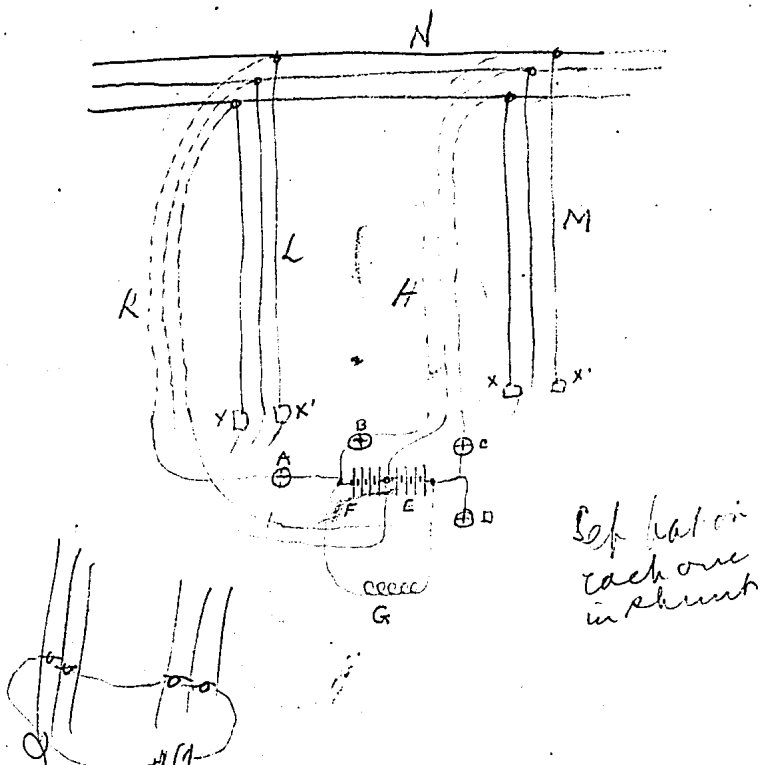
— July 1887 —

ordinary temperature will answer: after 1 to 3 weeks the action of the hydrocarbon liquid is such that it drops out the water from the material surrounding the fibres, & destroys all the adhesive properties so that when the material is taken from the tanks, running water will carry off all the pulpy matter and leave the fibres perfectly clean. They will not be injured in the slightest by this operation, whereas by rotting, hackling & use of acids & alkalis as is now the case the fibre is very much broken and weakened. Almost any liquid of the nature of a hydrocarbon, which is insoluble in water will answer further reaction, but I prefer to use, petroleum oil being cheaper & as good as any Oxygenated Hydrocarbons insoluble in water Bisulphide Carbon Ether & many others can be used.

(1) Dept 7/39

Eyles -

Patent




Coil on each one in shunt

Improvements in Methods of indicating Electric pressure in Central Electric Light Stations =

2

The invention consists in the employment of a standard battery giving the same electromotive force as that required at the ends of the feeders combined with several sets of pressure or return wires multiple and across such battery through galvanometers A B C D The battery is so connected that it gives a contrary electromotive force to that due to the dynamos so that when the pressure at the pressure wires is 100 volts positive the standard battery will give 100 volts K + however no Current will pass through the galvanometers A B C D + they will stand at Zero indicating that the pressure at the End of the feeders K M is correct, but if the load on the mains N decreases or one of the feeders

out in the other - and reaches to say 101 Volts, then there will be a current due to a potential difference of one volt & this will deflect the indicator it may then be brought back to zero by means of the feeder regulator X X' a Resistance G is placed around the battery to keep it in good action ~~as~~ by this method the accuracy of the results do not depend on the indicating apparatus which ~~Each~~ need not be delicate and a deflection of several inches may be had due to a difference of one volt ~~other~~ The maximum difference that is possible by standardizing current is obtained by this method, hence friction & other defects which render ordinary indicating apparatus so liable to ~~the~~ incorrect reading.

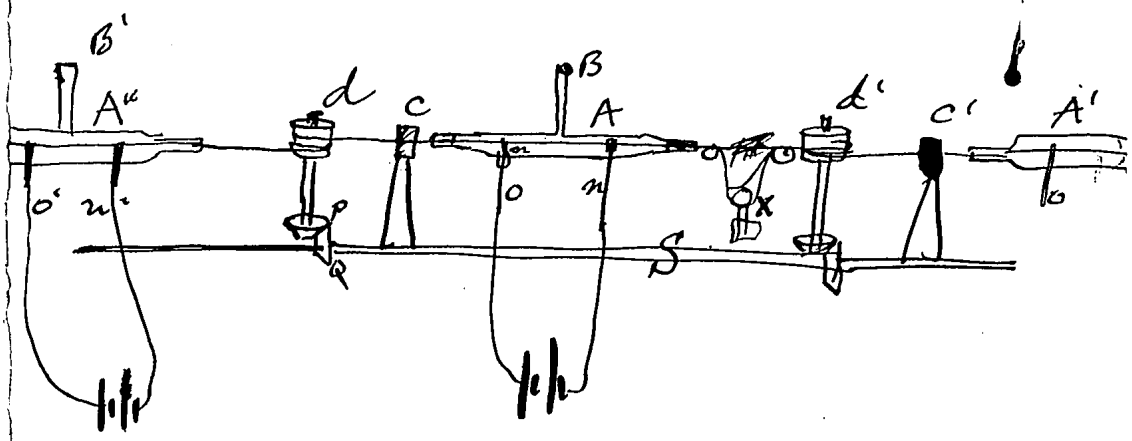
owing principally to the ~~[illegible]~~
necessity of great delicacy
to obviated - As all indicating
apparatus is organically retarded
by the Battery it follows that a
properly constructed Battery is the
best possible device for securing
Constant processes in a Station
over a long period of time -
The Battery I prefer to use is
the ordinary gravity Battery with moderately
pure Zinc & Sulphate of Copper

I Leave make Broad claims for
this method -

E

736

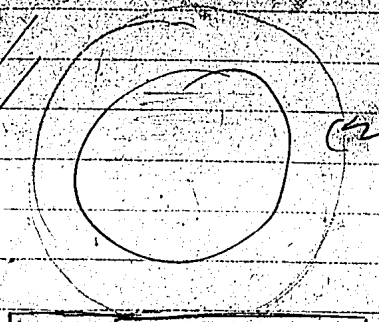
You remember I have ~~two~~ applications for drawing wire — one for annealing by a Current & one by gas heat while wire is in a chamber — ~~Both~~ These have objections — ~~Take out of~~ put in a new application



A is a glass tube filled through B with Hydrogen or other reducing agent under slight pressure. The wire passes through stuffing Boxes at the Ends - to the left it passes through the die C it is drawn along by the Revolving drum d by means of the shaft S & Bevel gear p q — O & N are contact springs which allow a portion of Current to pass through the wire & heat it up to the annealing point. Oxidation being prevented by the presence of the reducing gas which serves to reduce any suboxide formed on the metal while passing through the air = a weight X serves to allow a little slack to compensate for the slightly different speeds required between each jump — This process is for drawing Exceedingly fine Wire not now possible except at great Expense & not very great lengths =

Strong claims & Soak — Edison

Oct 8th



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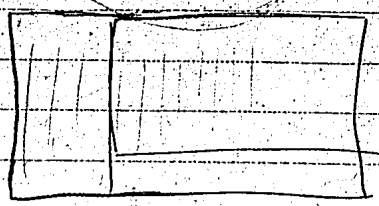
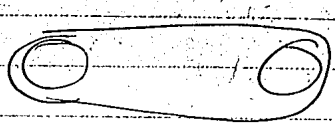
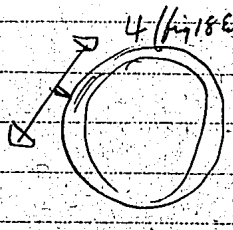


(3)



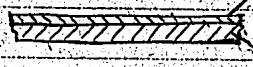
5 (fig 3.3 - E.P.)
side elevation



4 (fig 1.8 E.P)

6

fig 3.8 E.P



way

(1)

hatch

6/3

3.2 perspective / 3.2 way

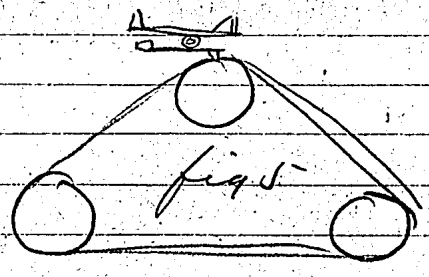


fig 1

Rec'd Oct. 22. 89
H. W. Leecy

Orange Oct 20/89

The object of this invention is to diminish the amount of Copper in the distributing system of Central Station Electric Lighting so that large areas can be supplied from one central station without the use of large amounts of Conducting material and without the intervention of apparatus wasteful of Energy. The ~~[illegible]~~ direct connection of the translating devices. The Consumption of Energy being in proportion to the number or size of the translating devices.

In ~~previous~~ patents, I have shown a method in what is called the 3 wire system whereby the two sides of the system are balanced by causing ~~[illegible]~~ automatically or ~~[illegible]~~ by mechanism controlled Electrically from the

273
600
163800

.67
1146600
9828
109746.00

4) 2.675
.669

.667

156
900
140400
.67
9828
8424
94068

185000
.67
129 5000
1115
123,950.00

184
700
128800
.67
9016
7728
86296

Central station, a group of lamps to be thrown over from one side to the other, so that if it is found that one side has more lamps on than the other a definite portion may be disconnected from so the heavy overloaded side & fed from the light loaded side so as to effect a balance in the panels operated off — The present invention is an extension of the same idea & more applicable to large & very extended systems of distribution and on 4, 5, 6 or more wire systems, It being essential in any extension of the 3 wire system to a 4 5 or more wire system that the balance should be very even as above a 3 wire system the The difference of pressure due to out of balance is in certain Conditions not regulatable by varying the resistance of the feeders

and as it is a great saving to use very small neutral wires in the feeders it is necessary that the balance shall be such at all times that only a comparatively small current shall ever pass through them; Hence it is essential that in a large area a large number of ~~Switches~~ groups of effluent points shall be capable of being connected to any circuit without running a great number of separate circuits to the Switching mechanism ——

The mountain Currents in placing a number of boxes throughout the district containing Switching mechanism. Each controlling all the lights in a certain house or store, The boxes are placed preferably on the poles like fire alarm boxes ——

Each box has two Electro magnets, one large the other small —
If there are 20 boxes a circuit of ordinary telegraph wire runs from the station through all the small magnets; Fig 1 another circuit runs through all the large magnets, the 2 Extreme Ends are connected to the outside wire of the system, at the station there are two dials C C' worked by magnets, 2 Keys K K' serve to open & close the circuit, R is an adjustable resistance, the two circuits joint & are connected to the other side of an dynamo thus giving 100 volts to each circuit.

Fig 2 shews the Switching mechanism a is a ratchet wheel with a greater number of teeth than there are boxes in the circuit — d the click.
H the magnet Lever K the retractile spring

L the limiting screw M the small magnet n the backlash click C the locking click stop. on the shaft carrying the ratchet is a disc b with a notch a the notches in each disc in every box is in a different part of the periphery of b, f is the unison arm g the unison stop pin — m is the unison releasing arm connected to the lever S of the Large magnet M'

E/ except at one point, where the M' mechanism is to be removed

Thus if the Operator at the central station taps the key of the small magnet current a number of times the rotation of the Ratchet shaft will cause the Coarse screw to advance the unison arm up to the unison pin & stop further rotation — now by depressing the Key of the Large magnet current once the arm M throws the arm f upwards & a spring pulls it back to the other Extreme of the Screw on the shaft — Thus all the

Ratchet mechanism controlled by M in every box can at any time be brought to a definite point & be in unison—
When in unison there is no notch opposite R or S in any box—
but there is sufficient space for R to work from its position afforded to the periphery of the wheel to trip the Unison mechanism—
Having brought all the M mechanism to unison—The M' mechanism can be brought to unison, the disc may be advanced to such a position where the Notch Q is opposite R of every box
~~but not to any other box~~
The large magnet circuit is now worked and as T' is a similar unison the lever T will soon reach the unison stop pin & stop further rotation on working M the lever P of the release the unison & both magnets

Systems are in unison. ~~[illegible]~~
~~a one tooth further the catch~~
~~in box 2 is opposite~~

Supposing all the boxes have both mechanisms in unison, The Customer or house are connected permissively among the boxes No 1 box when in unison has the house on No 1 circuit No 2 box on No 2 circuit & so on So that in practice The houses will be connected to balance each other when the mechanisms are all in unison at one point, about 1 box for Every 15 houses will be enough in practice (10) 10 lights Controllable will balance Every 150 lights uncontrollable, 3 is the switch ratchet, 4 the click 1 & 2 are rings one ring connect to spring 4 & one to spring 4' The spring 6 ring split around the shaft so the two halves are Electrically insulated from Each other - on these rings.

Rub two springs W.V. wires from these springs pass to the brass where the lamps or other translating devices are connected in Multiple are —— 6 to 12 are contact plates on a insulating disc 13. These plates are connected to the 5 wire system as shown in Fig 3, by the rotation of the switch shaft the group of lamps on W.V. are successively thrown on the 4 circuits, by advancing 4 points, owing to the use of an Electrolytic Meter The other half of the revolution cannot very conveniently be used here to bring the group of lamps back to the 1st circuit. the mechanism is not allowed to rest on the other 4 points but the arm 4' is brought back to the original position

~~fig 4 sh~~ 9

fig 4 Shews the box on the pale
1 2 3 4 5 are the wires off the 5
wire balance system X X are
insulating pieces in the circuit
to cut in the large & small magnets
in circuit, & rg are pressure
wires - etc —

fig 5 shews Unisa mechan
& disc 6 with watches in
different positions.

Now supposing the 2 system balanced
& all mechanisms of boxes at
Unisa — Ampere meters fig 1
on neutral wire shews no current,
now supposing a ~~[redacted]~~ consumer
shuts off his lights on circuit No
1. the balance is destroyed & a current
passing through the neutral
wire to station deflects the ampere
& shows say ~~[redacted]~~ lights —

30

or several Customers whose
aggregate amounts to 30 lights
have shut off —
The Regulating Operator, looking
at the dial C + C' fig 1
works the Key and working the mechanism
previously described disconnects
by ~~3 boxes~~ 3. 2 or more boxes
supplement lamps from the other
3 circuit + connects them to Circuit
No 1 to balance the system
which is immediately apparent
to him by the action of his ampere meter.
This mechanism can be used to
disconnect Contract Customers
feeders at a distance, Transformers
+ in fact every Kind of apparatus
I don't which to confine myself
to putting the boxes in series as
all these small magnets may be
worked in Multiple arc ~~or~~
one set + the large mags ditto —
in fact both magnets may be

Polarized & put on or across one
circuit & a ~~polar~~ Current of
one polarity intermitted work
one magnet & the opposite
Current intermitted work the
other magnet,
Instead of the Keys - a rotating
transmitter with break wheel &
dial as in printing telegh
may be substituted
The feeder as a Whole bias
its general pressure regulated
by feeder magnetators in the
ordinary way —

Claim the Earth —

Edison

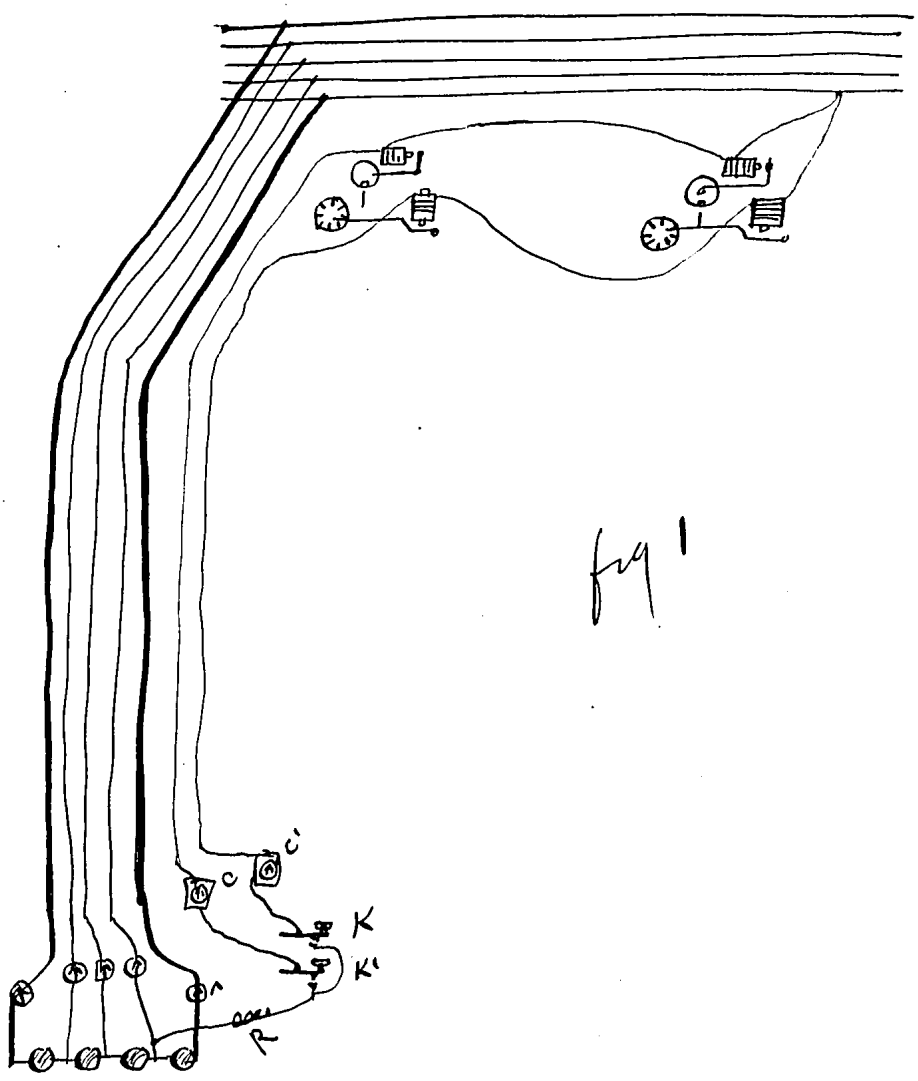



fig 1

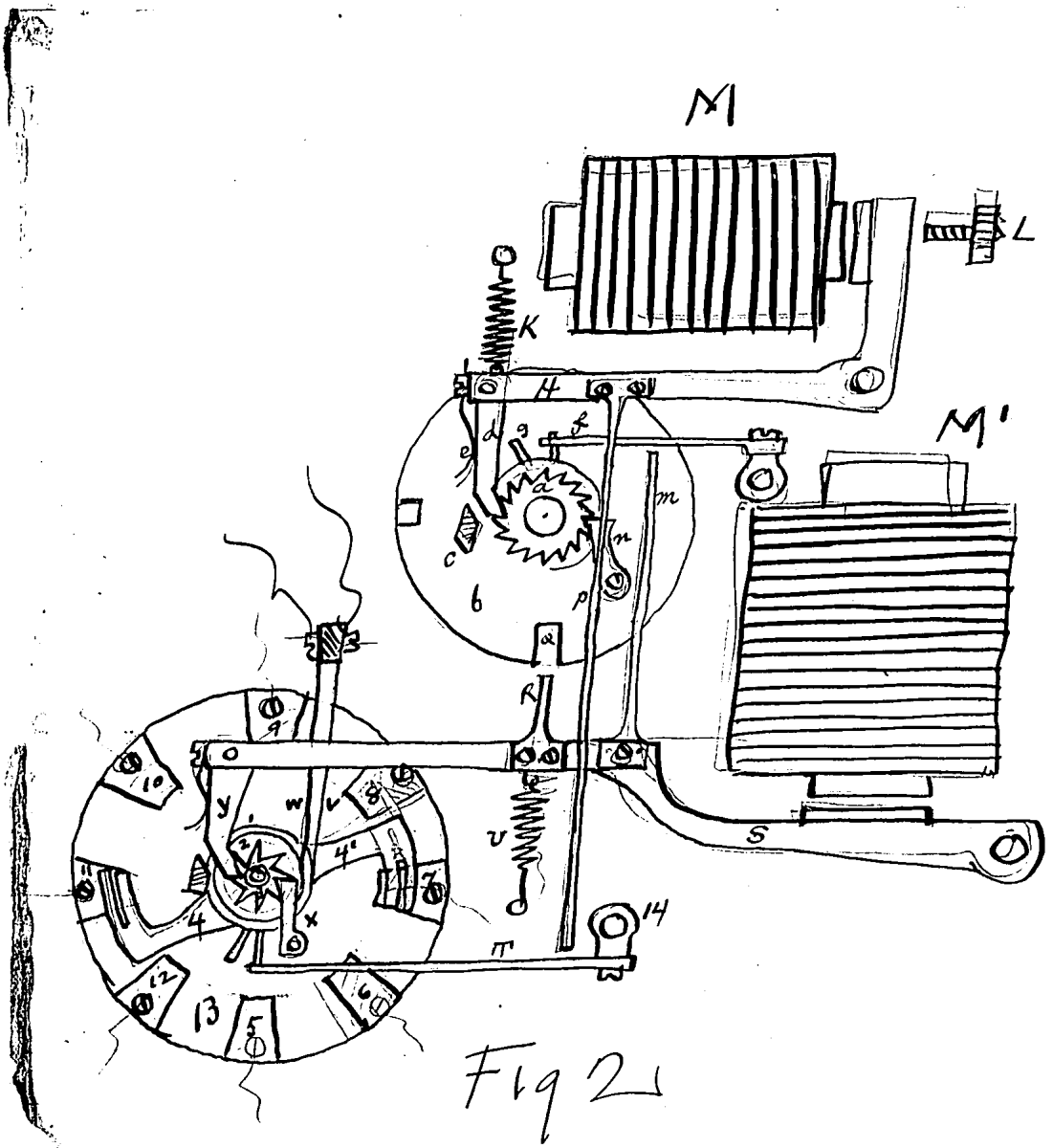



Fig 2

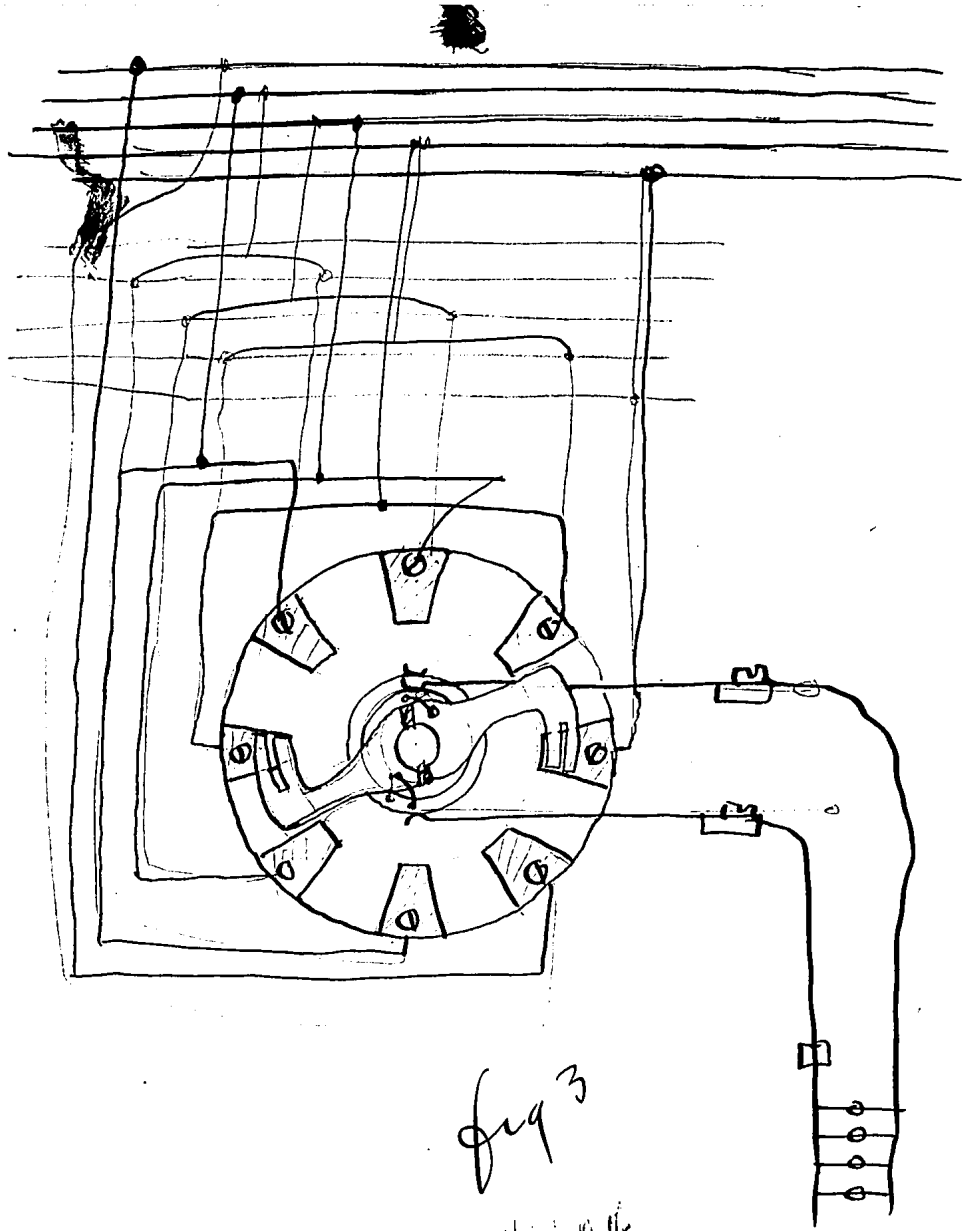


fig 3

Rub out the pencil

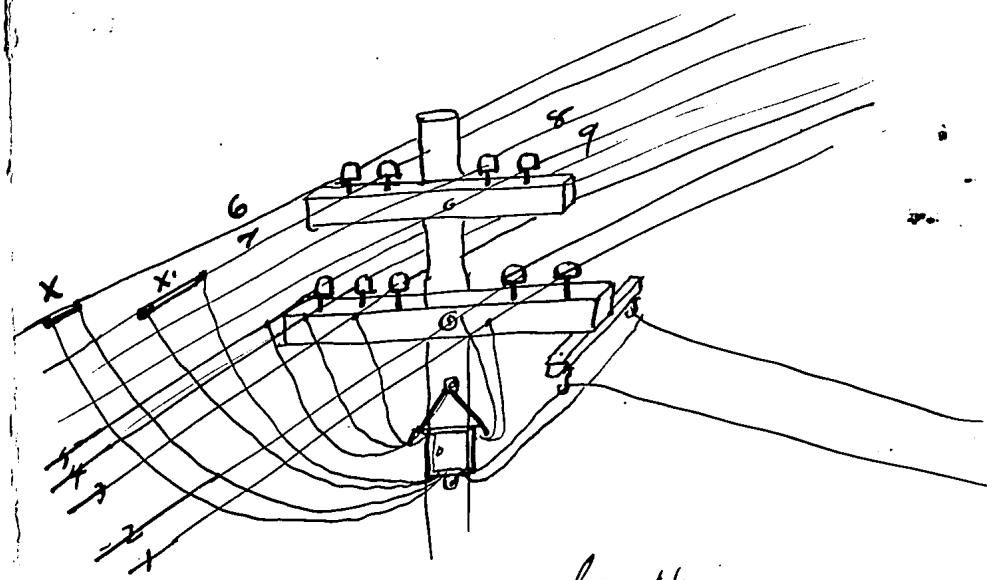
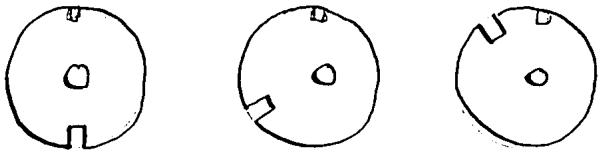
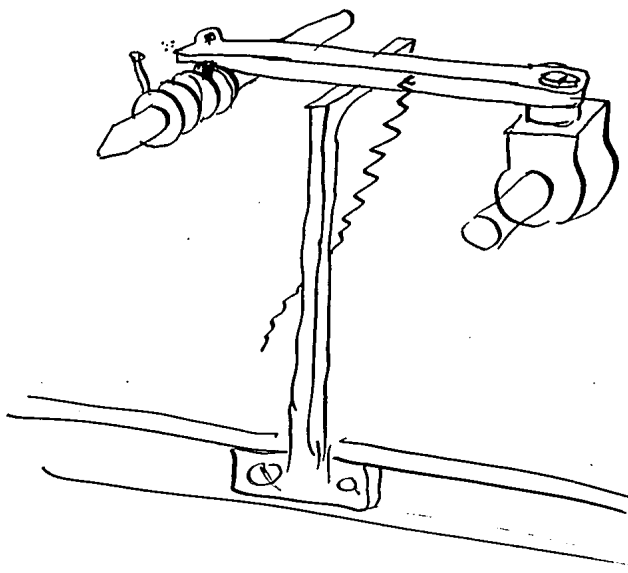
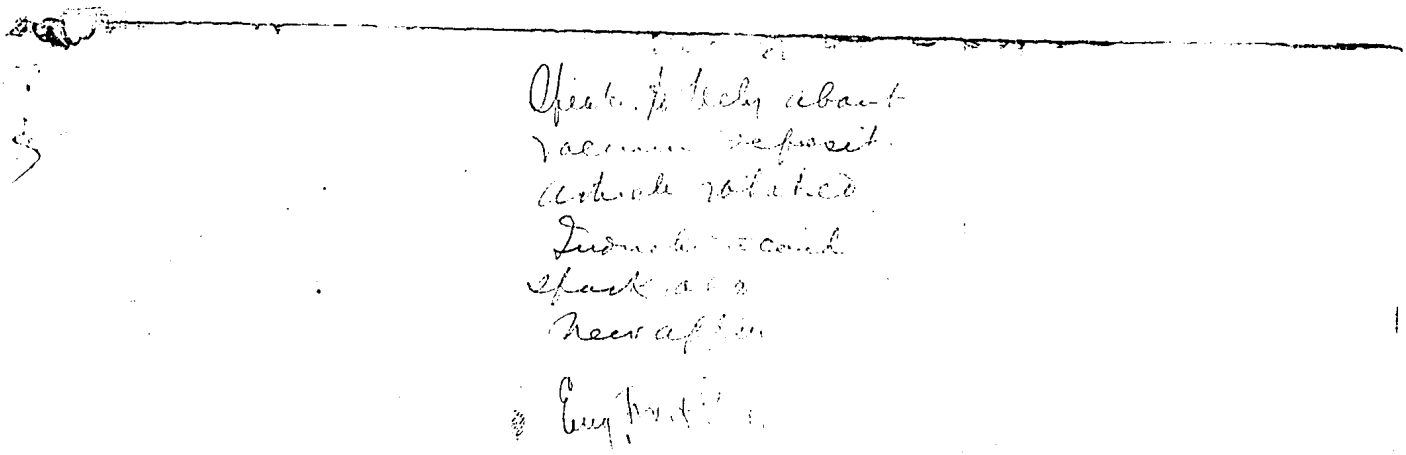



fig 4







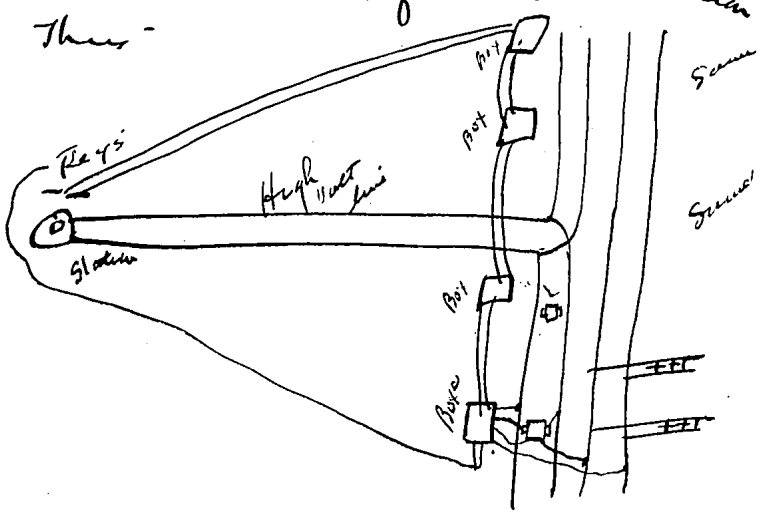
From the Laboratory
of
Thomas A. Edison.

Recd Nov 1 87 A.O.W. Seeley

Orange, N.J., Oct 29 1887

Dick—

Please fix up another Case With the shifting ratchet wheel device & apply it to transformers The object being to disconnect & connect transformers as the load decreases or increases all from the Station Thus-




From the Laboratory
of
Thomas A. Edison.

Orange, N.J., _____ 188

2

You know the trouble with the alternating system is that while the sale of light is usually all in 4 hours the loss in the transformers which is 8 @ 12 per cent according to Construction goes on during the whole 24 hours & the loss in some cases in the transformers equal the sales so you see it is a great stride in the direction of economy to connect & disconnect transformers as the load varies — get a strong claim on this head on the great economy etc etc I am certain they will rob a fool of this before long — Bill to Light Co as to for protection purposes

Edison

From the Laboratory
of
Thomas A. Edison.

Orange, N.J., Oct 29 1887

PS –

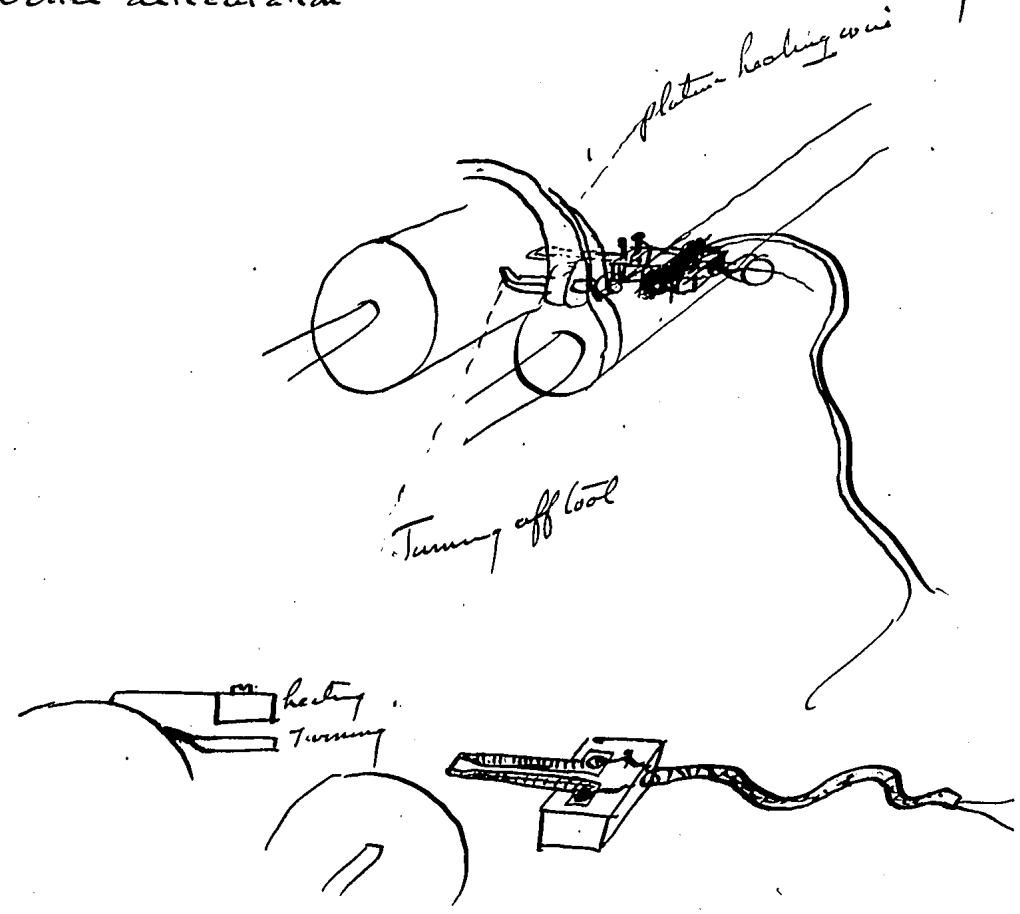
You might show seperate
circuits running to each
transformer from station with
magnet to central switch
also a hand switch at
each transformer to
disconnect –
also a time clock controlling
a switch to disconnect at any
precarranged time – If this
Can't be put in one patent
make 2.

E

Orange — Nov 17/87

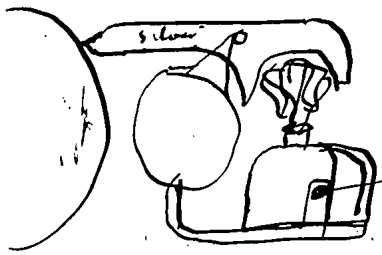
Dyer —

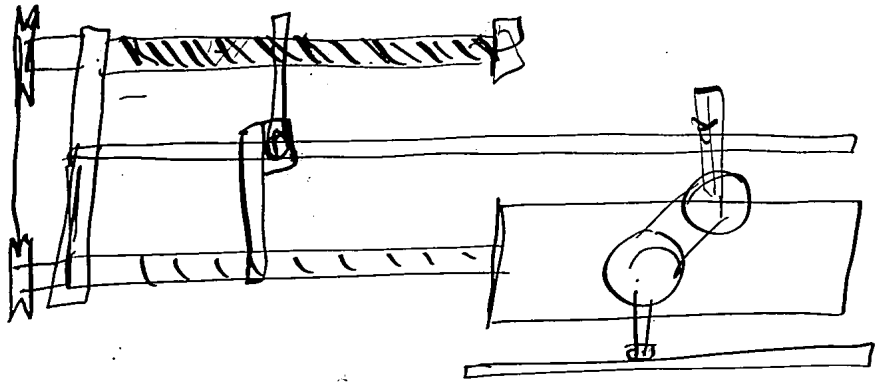
Be sure & incorporate the following in foreign & US patent — it works beautifully diminishing the roughness of the surface & giving better articulation

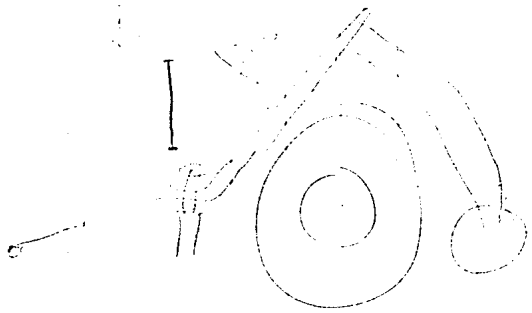


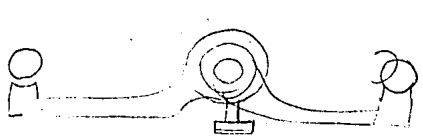
Both the turning tool + heating pakolon are adjustable, I find that the wire is kept sufficiently hot by using a shunt around two of the 4 Cells of the 6 volt + the speed of the Motor is not diminished by reason of it. It should be just hot enough to melt the outer surface of the wax, it obliterates the tool marks + gives a burnished like surface + is a great improvement. It can be cut out of sheet or a short length of .008 wire used —

You better mention that an aluminum or Silver wire of $\frac{1}{8}$ dia reduced to $\frac{1}{32}$ at the way may be used + heated continuously by a minature alcohol lamp travelling with the traveller may be used the heat passing to the point + wax by conduction.





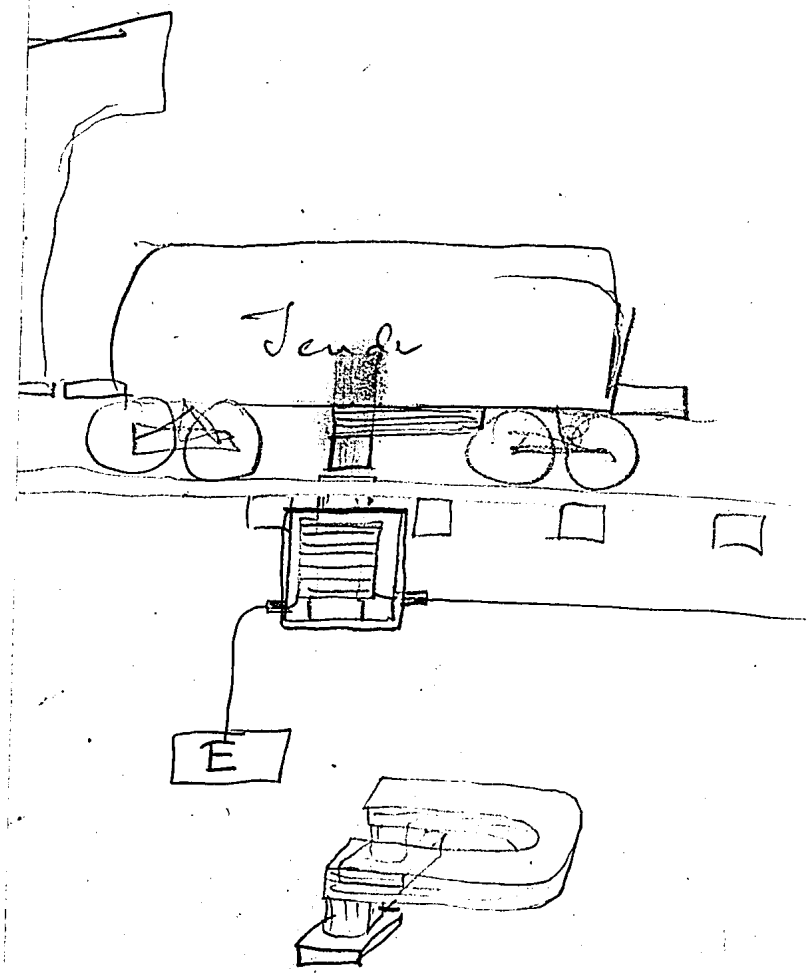


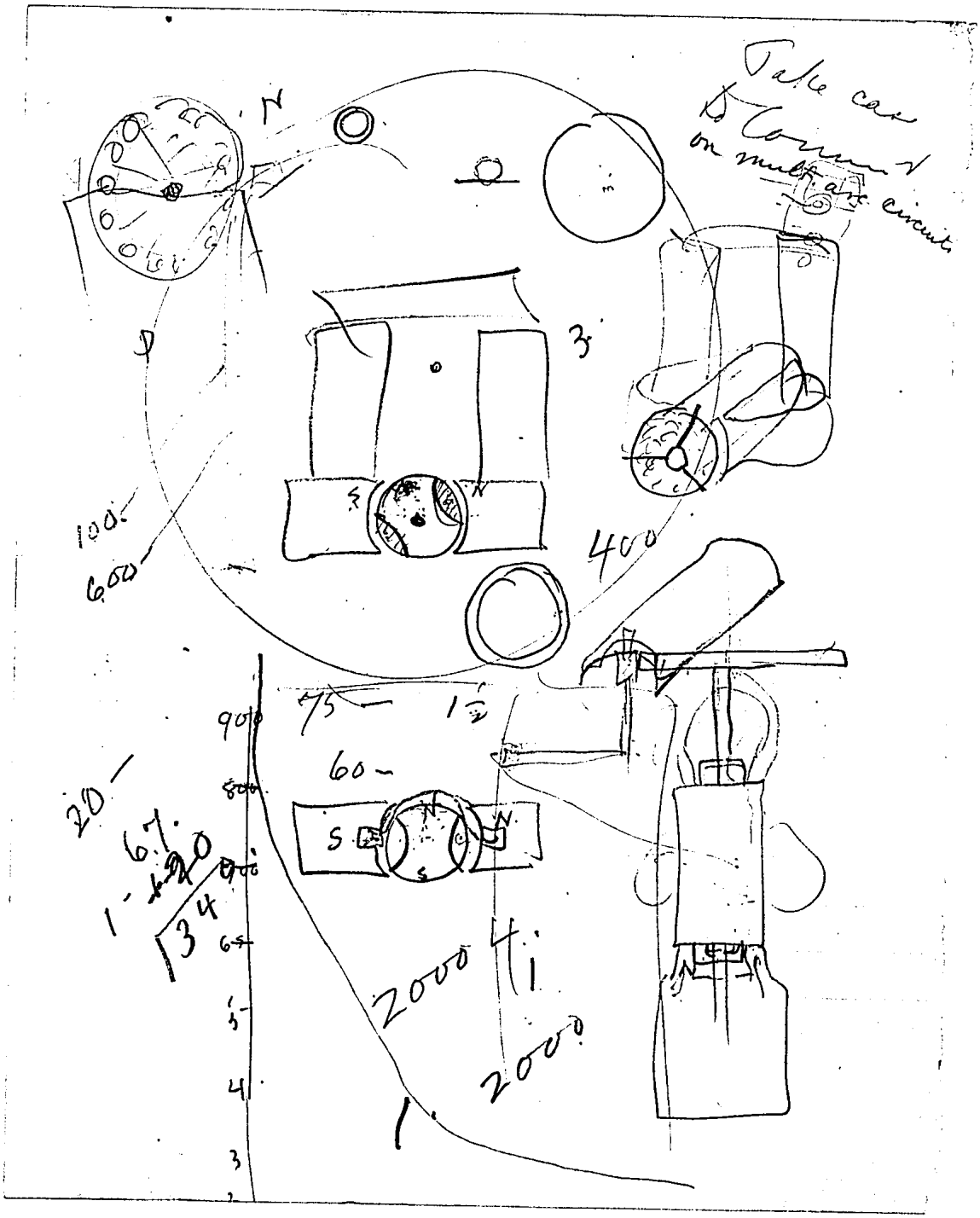


EDISON LAMP COMPANY.

THOMAS A. EDISON, President.
FRANCIS R. UPTON, Gen'l M'g'r & Treas.

HARRISON, N. J., ..... 188




Take care
to connect
in multiple circuit
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75
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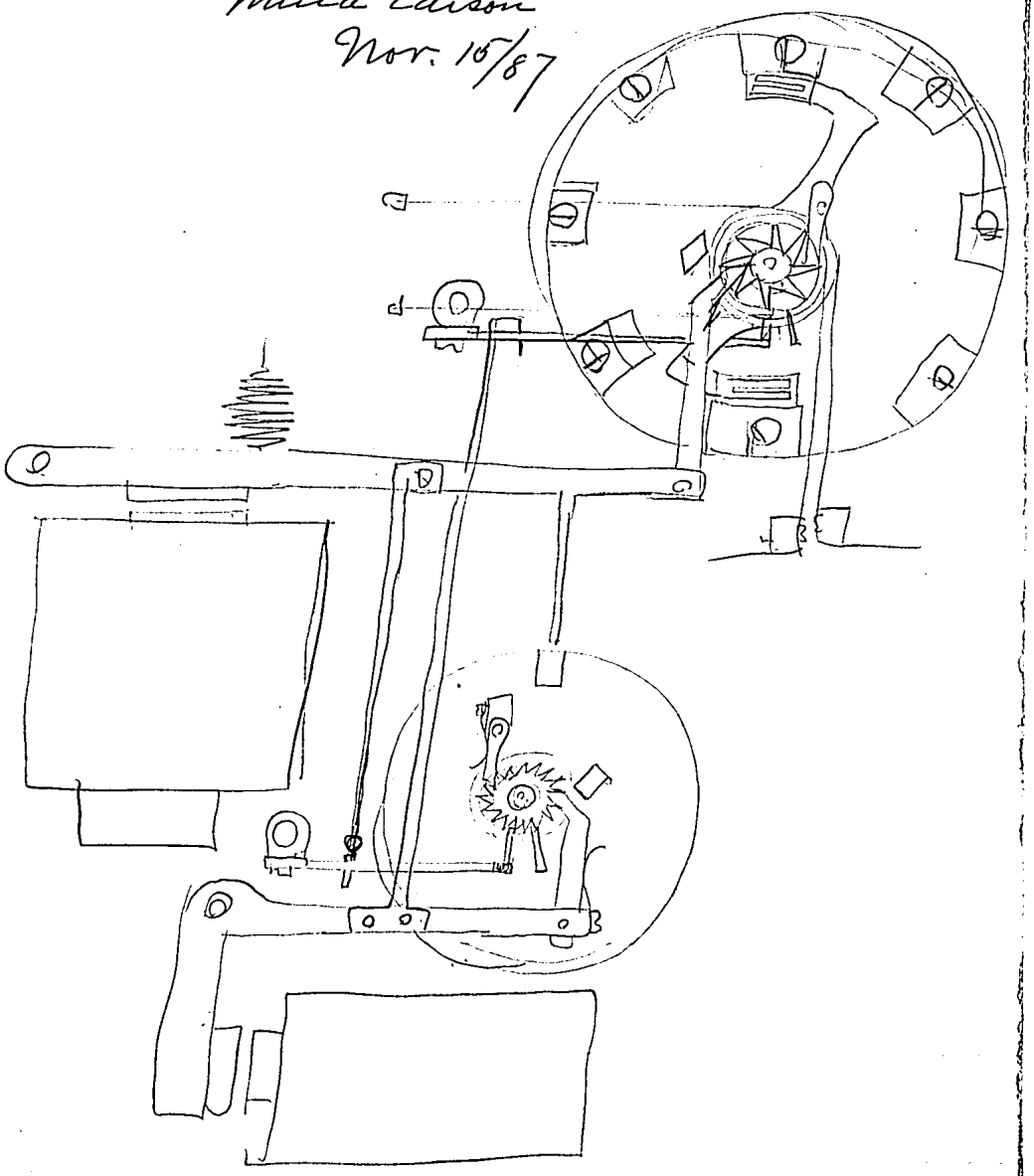
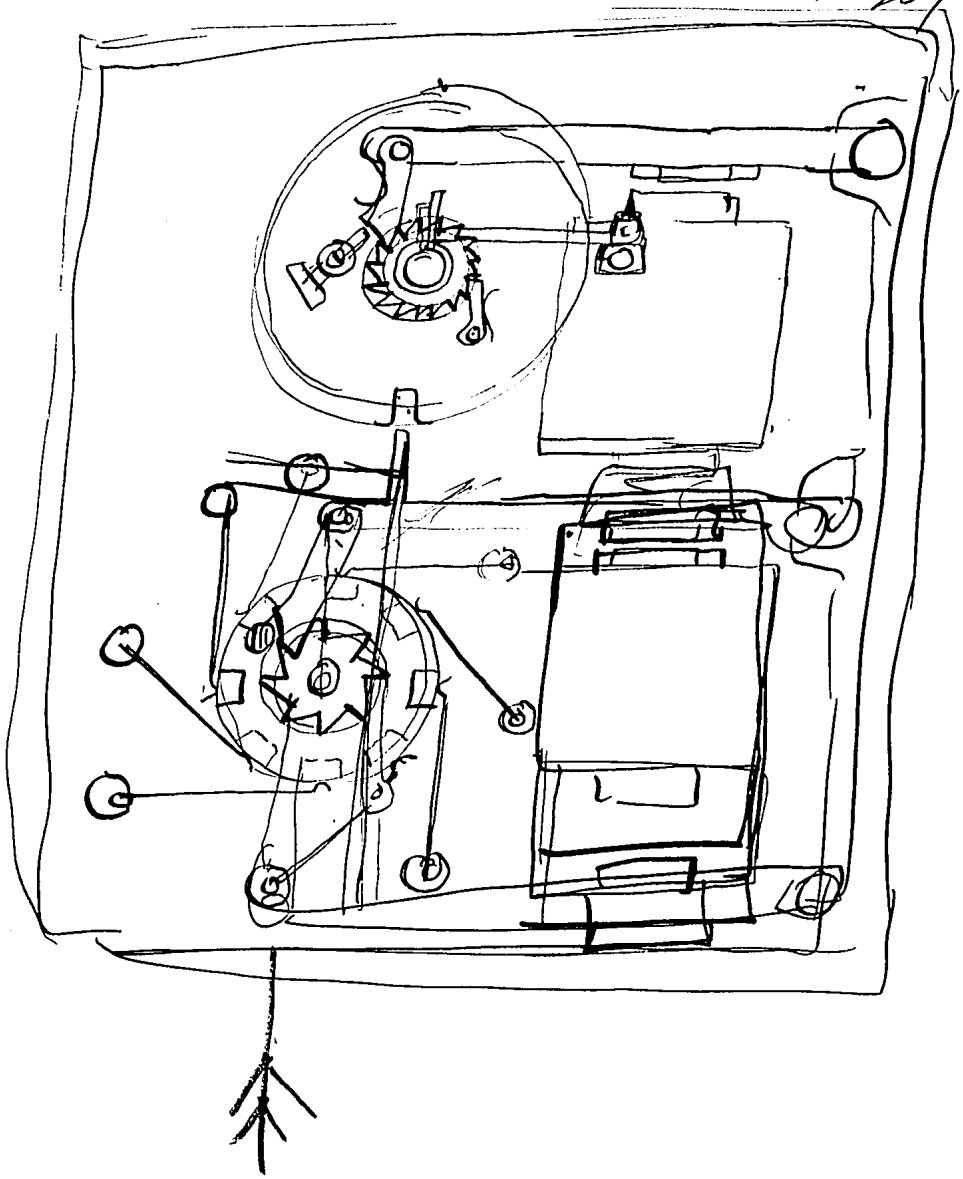
Look
up type -
while I part.

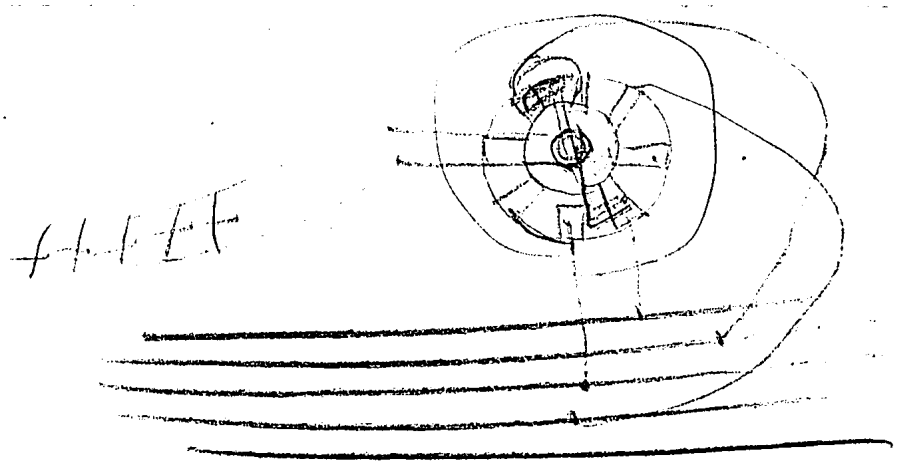
Butler

Thos. Edison
Nov. 10/87

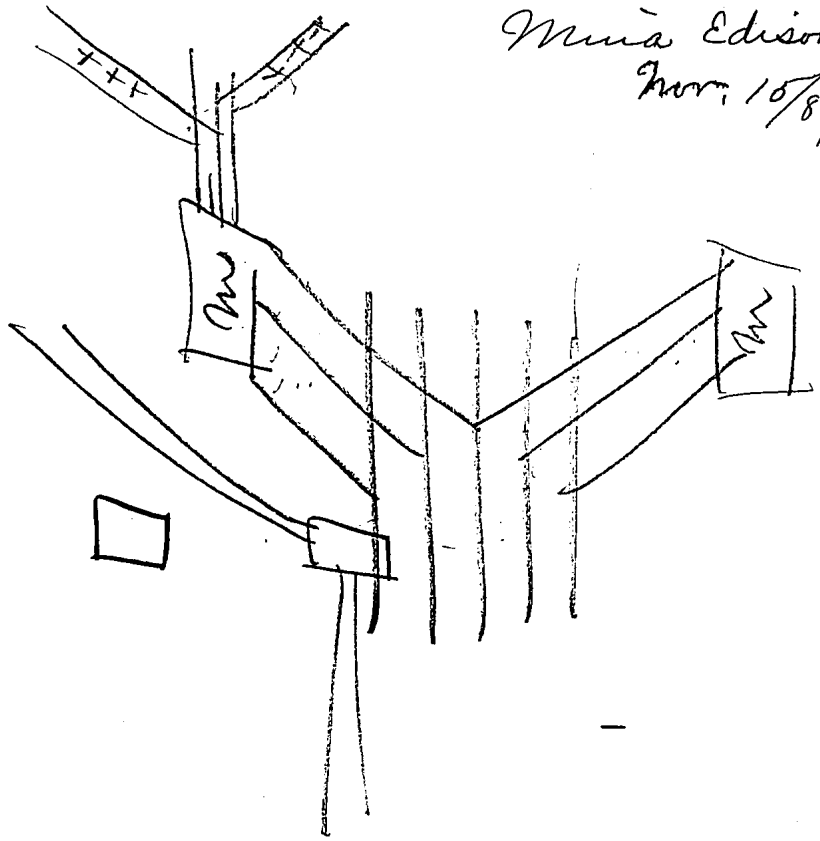


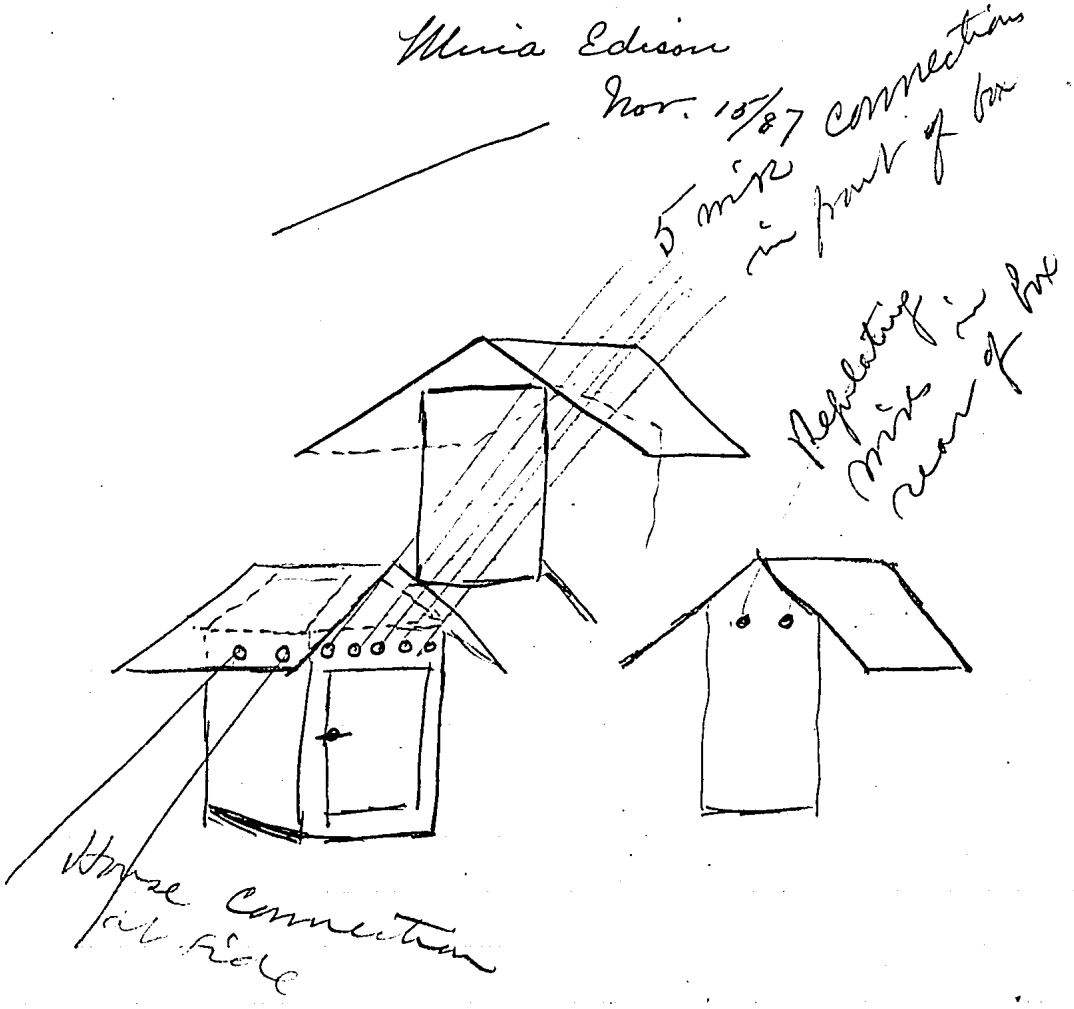
Mina Edison
Mar. 10/87

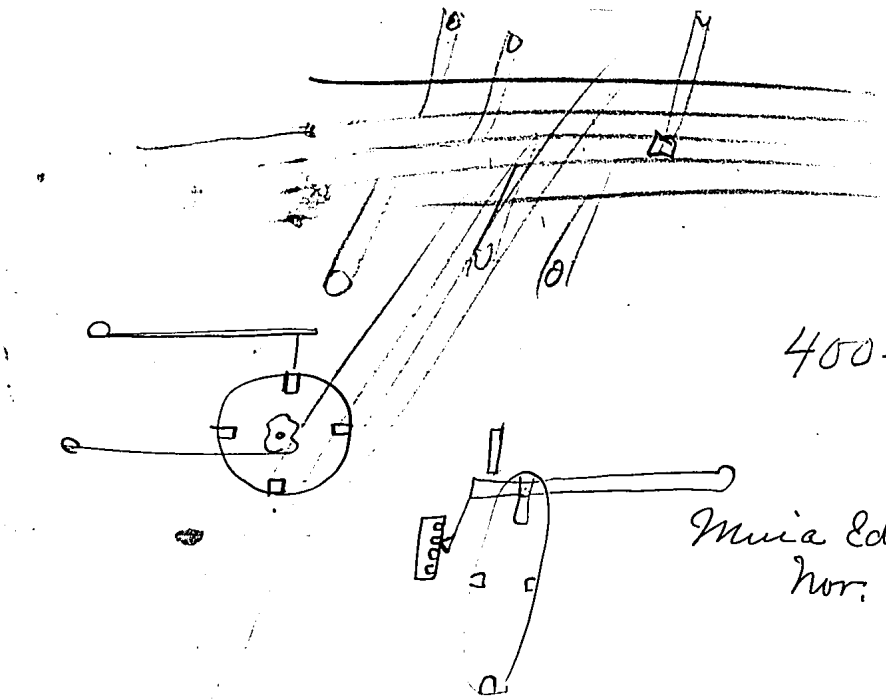




Mina Edison
Nov. 10/87

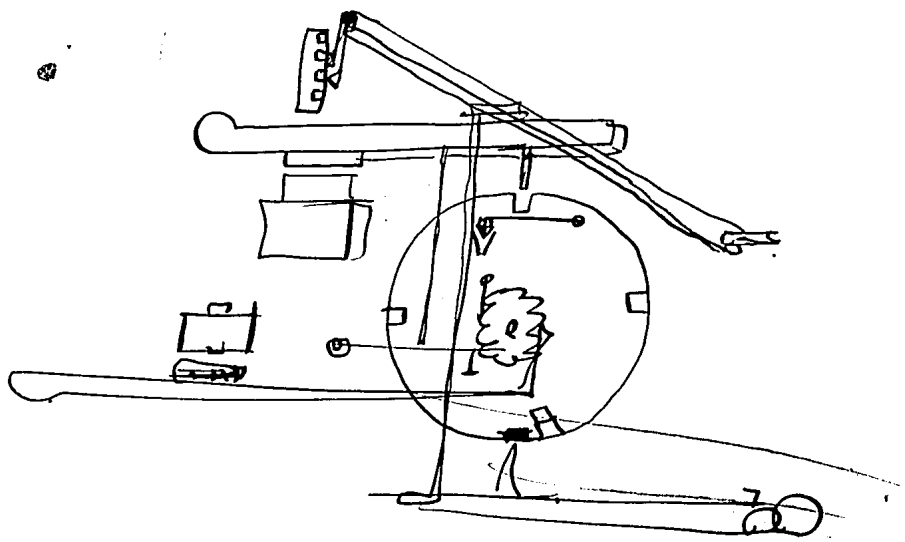


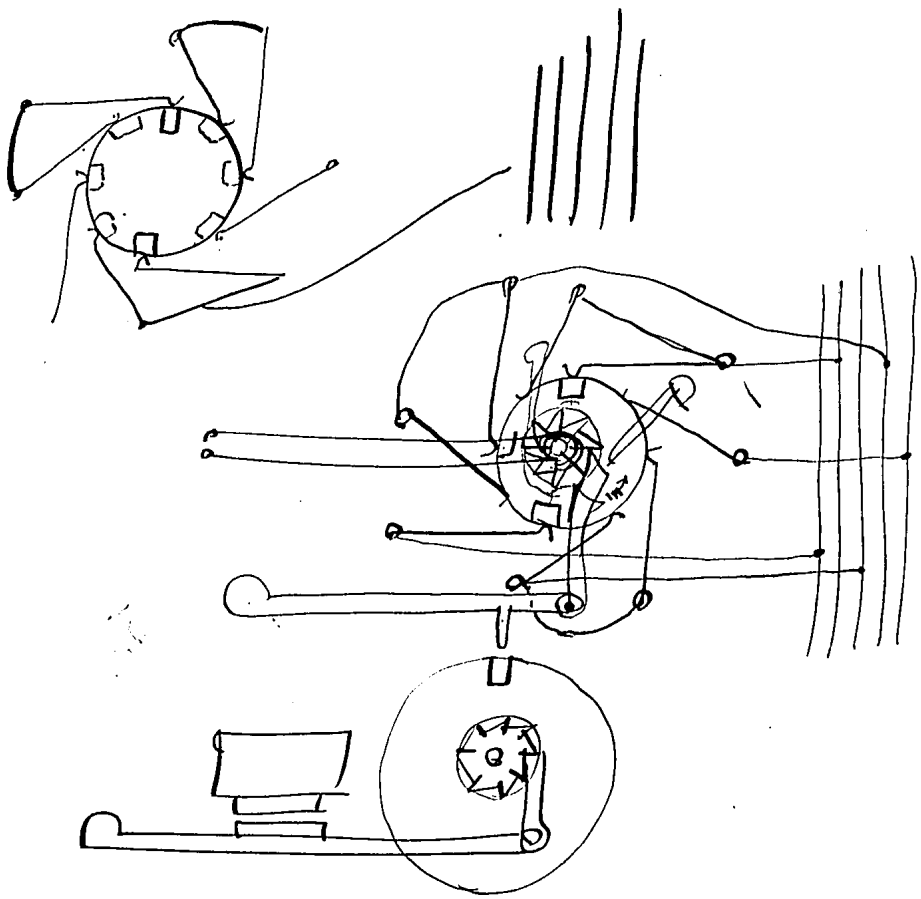

Illinois Edison
Nov. 15/87
5 min
in front of box
Repeating in
mirror
rear of box
House connection
at pole



400.

Mina Edison
Nov. 15/87

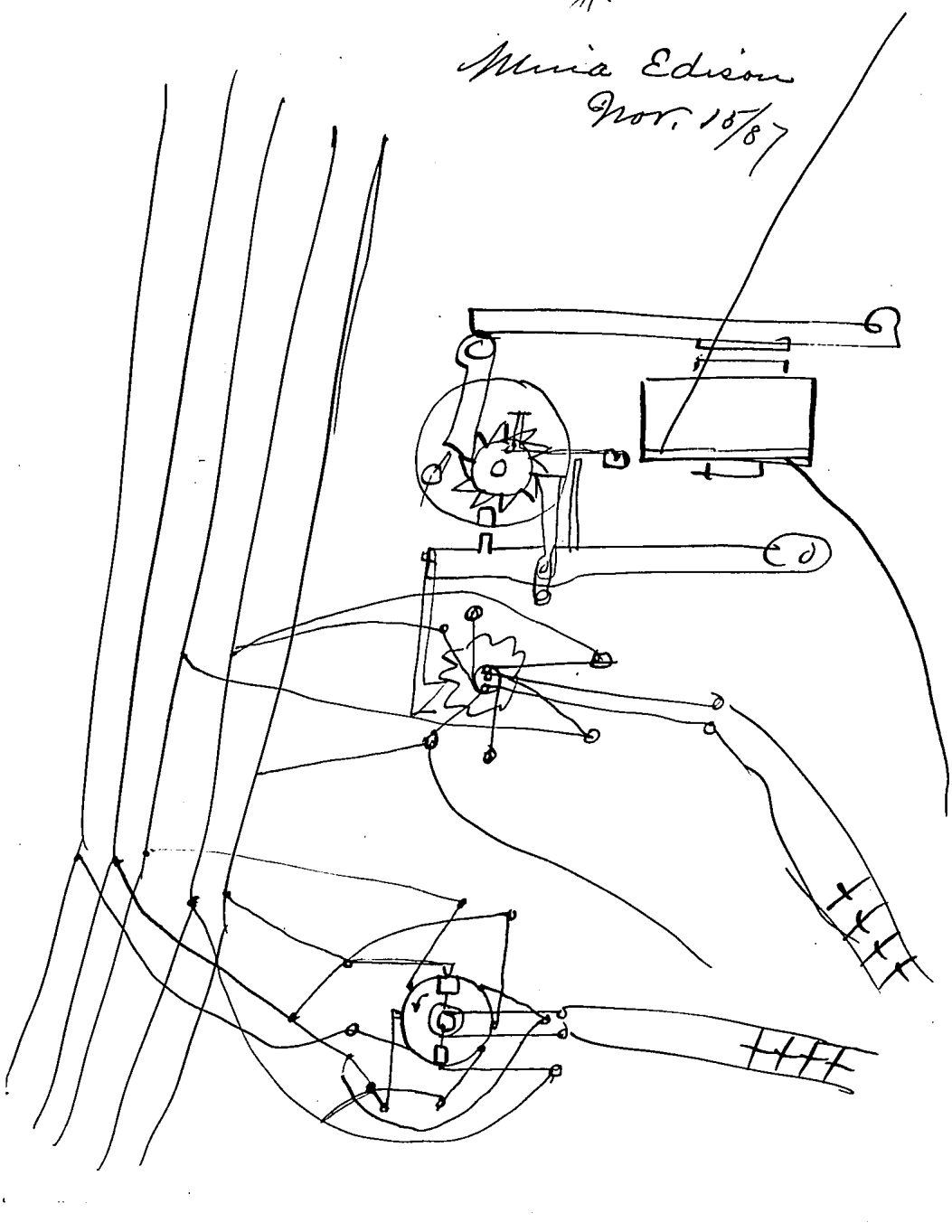


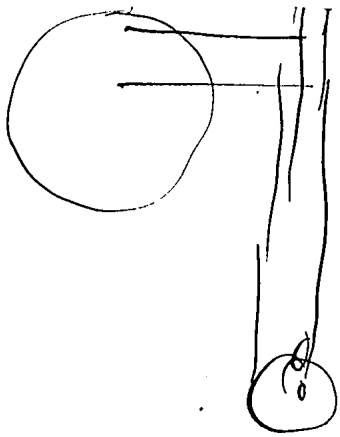


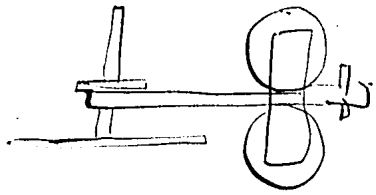
Mina Edison, Nov. 15/87

H H

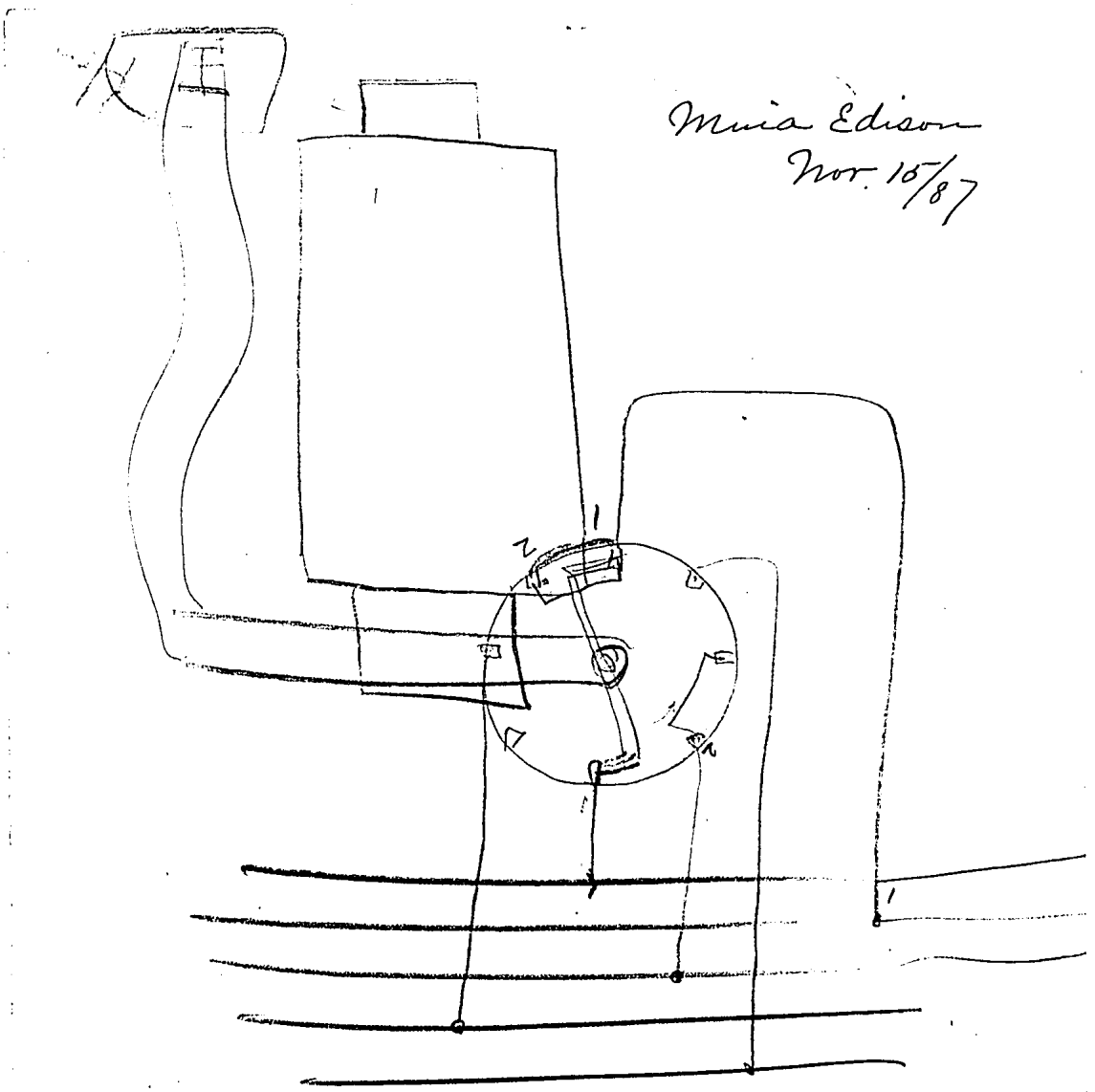
Mina Edison
Nov. 16/87

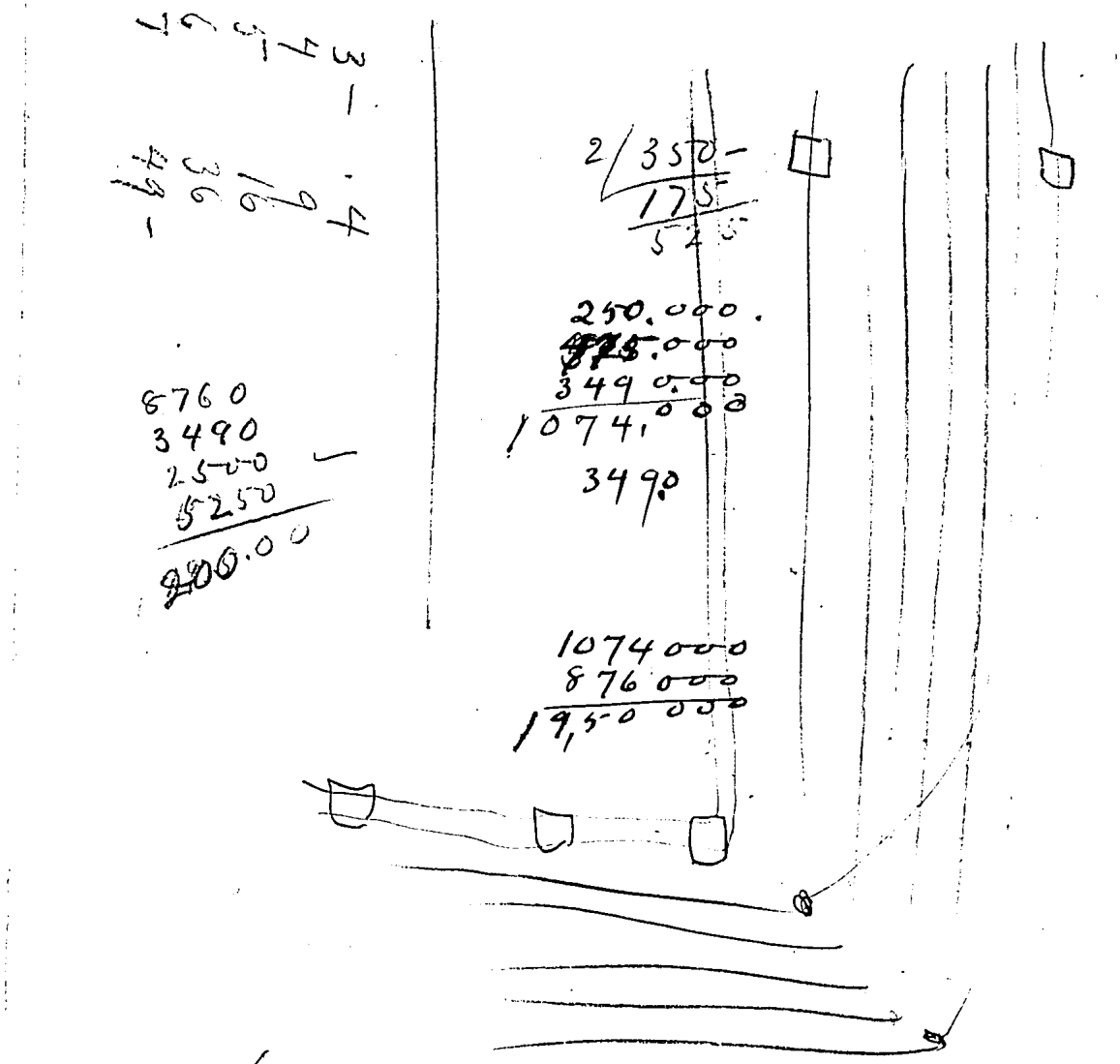






Mina Edison
Nov. 18/87


Mina Edison
Nov. 16/87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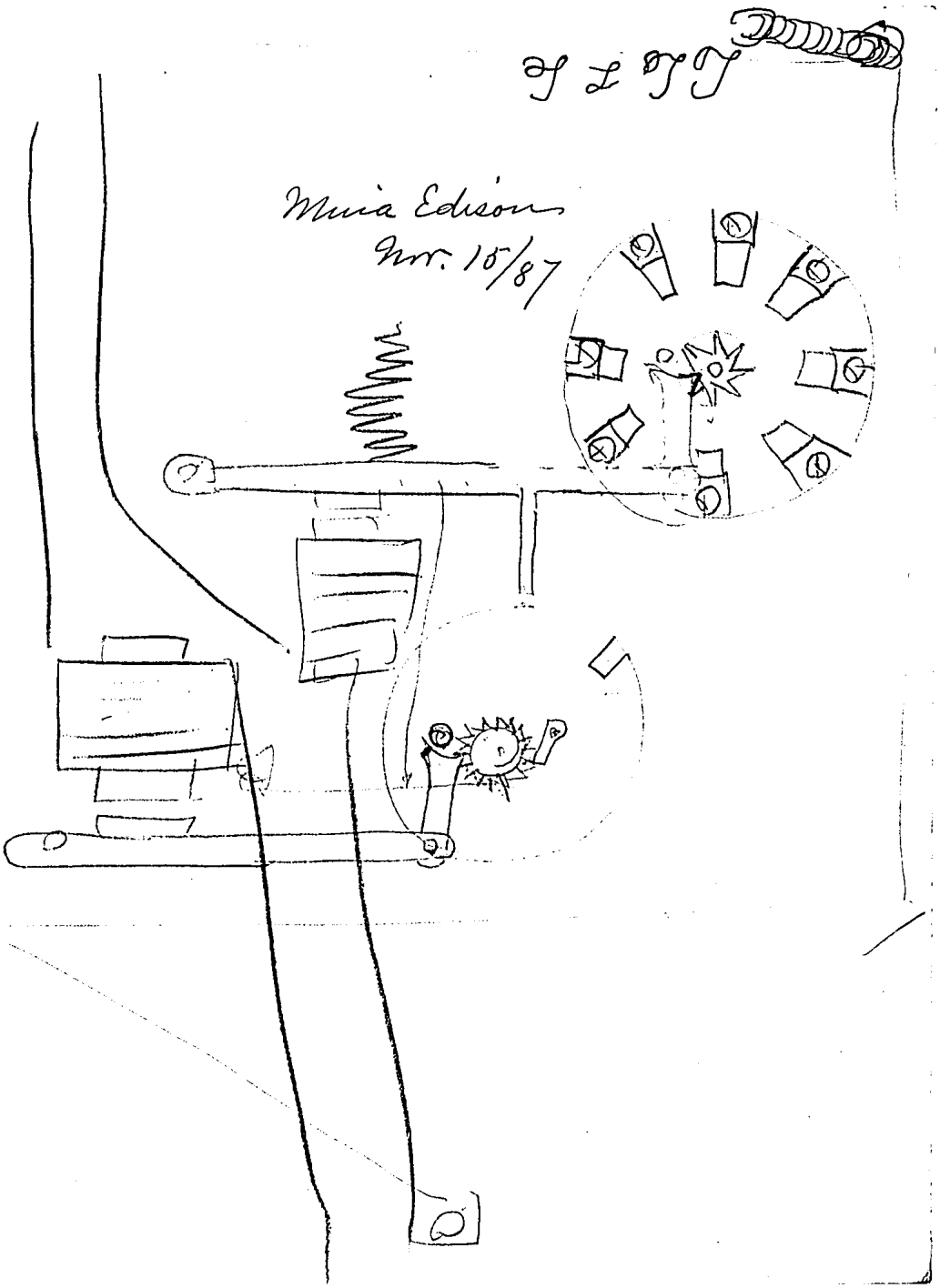
Mina Edison
Nov. 10/87

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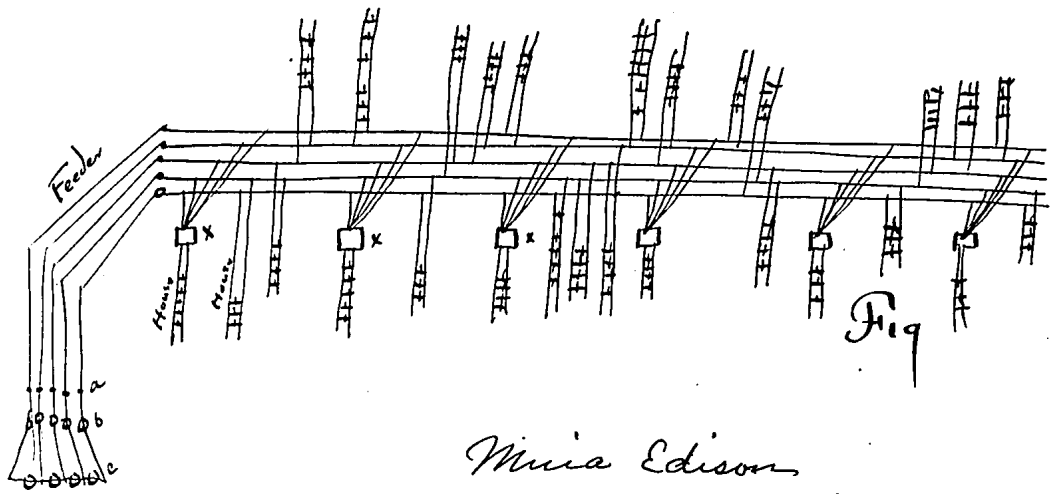
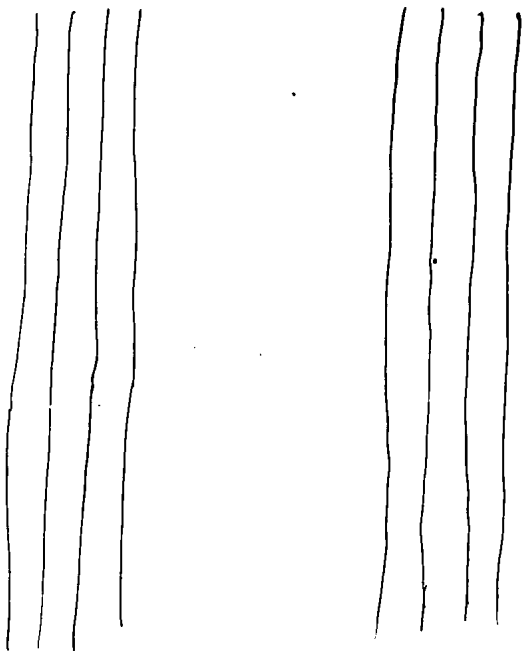
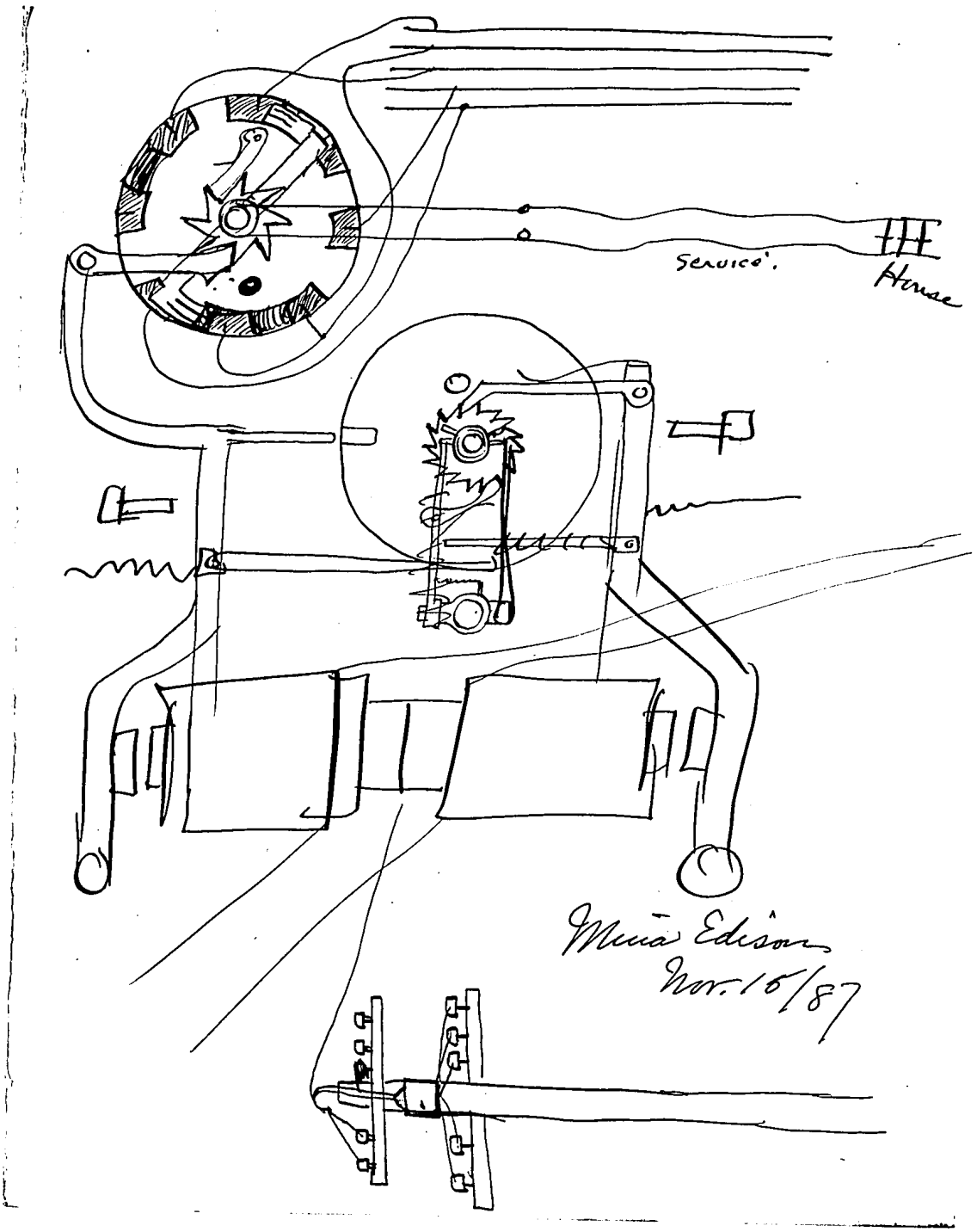



Fig

Mina Edison
Nov. 15/87




Service.
House
Miña Edison
Nov. 16/87

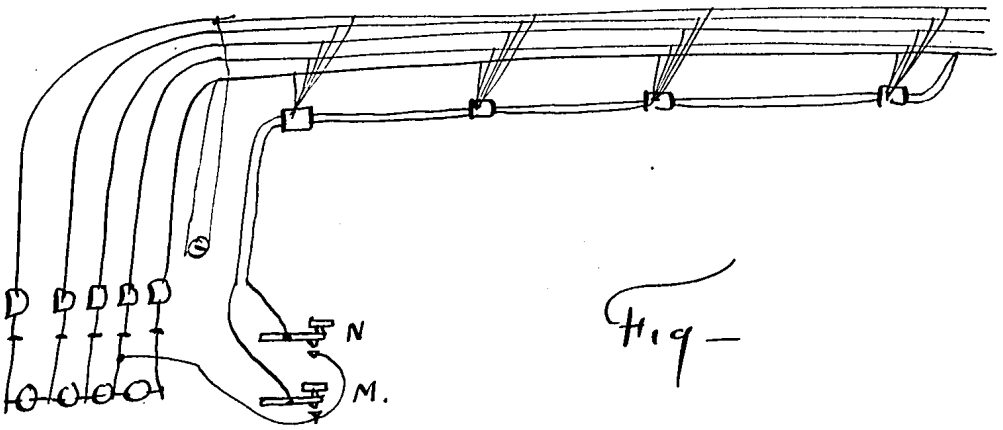
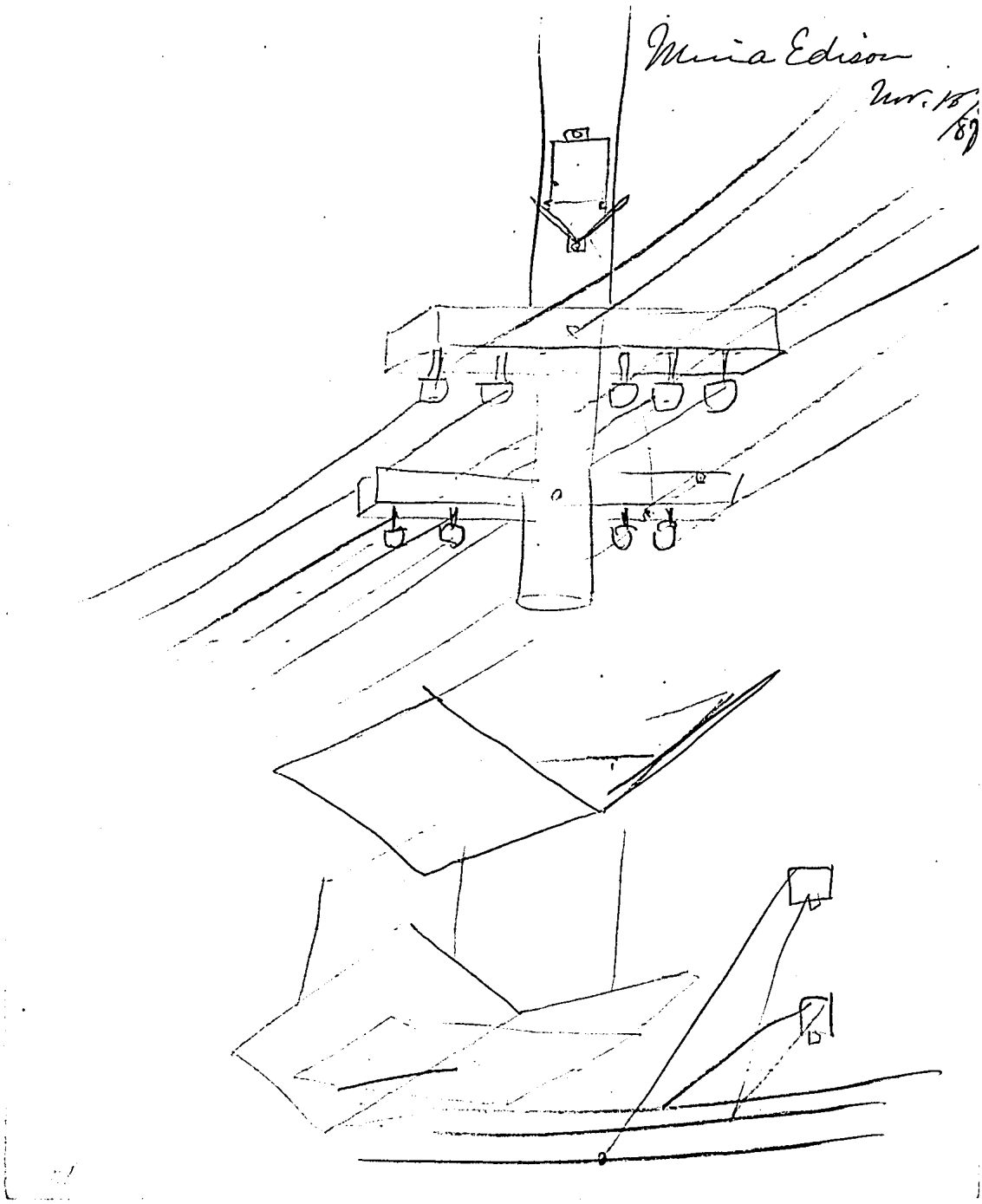
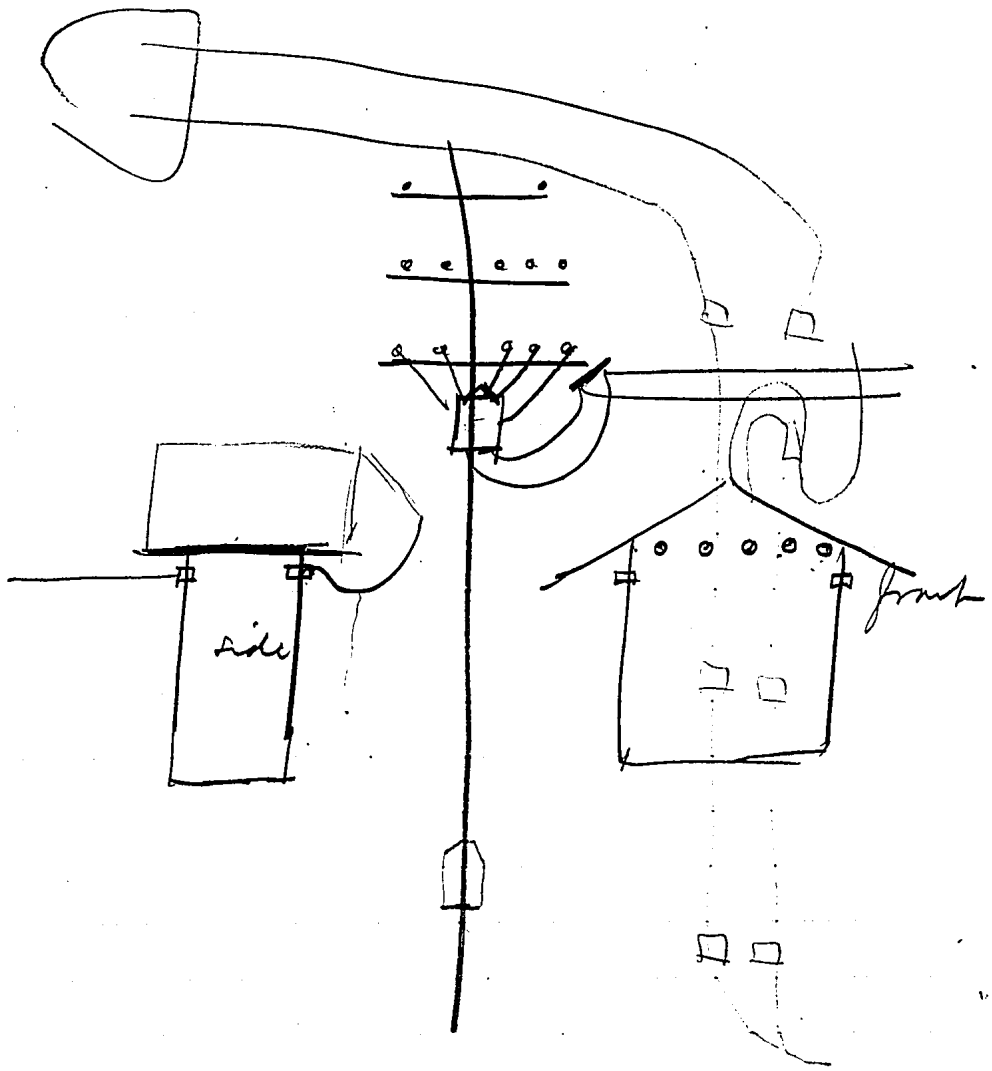



Fig -

Mina Edison
Nov. 16/87

Thos A Edison
Nov. 15
89

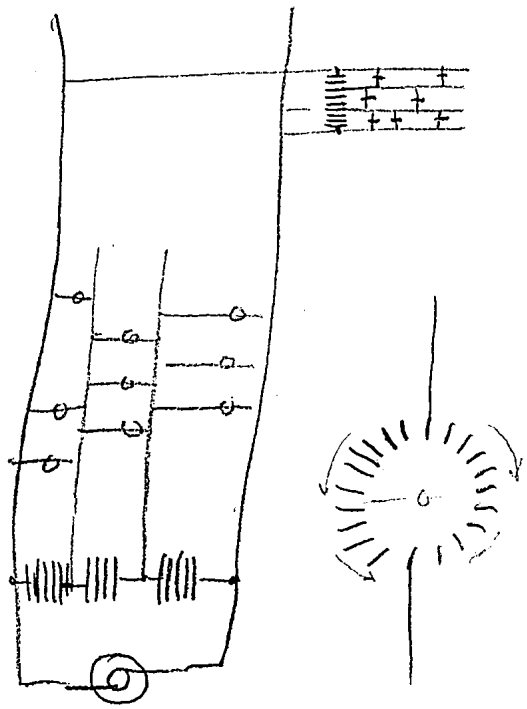



side
front

From the Laboratory
of
Thomas A. Edison.

Mina Edison
Nov. 15/87

Orange, N.J., _____ 188



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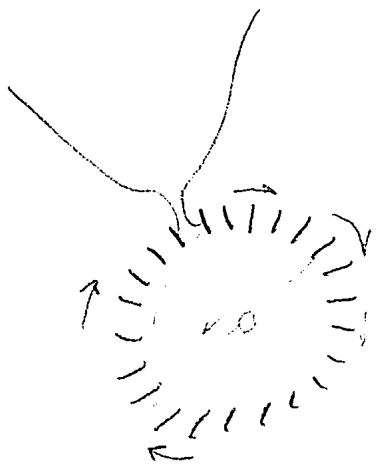
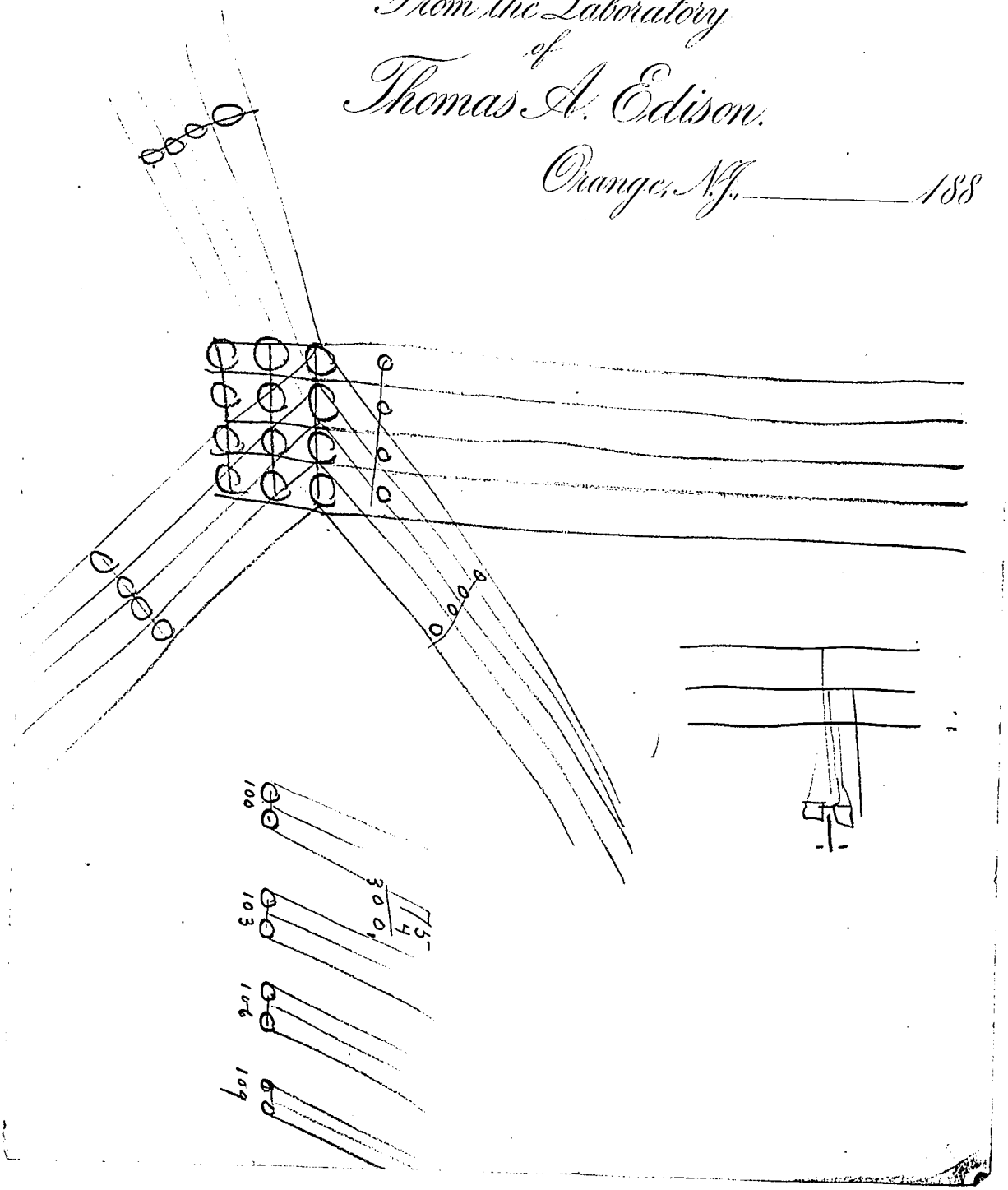
Nov. 16/87



Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Orange, N.J. _____ 188



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of
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Nov. 18/87

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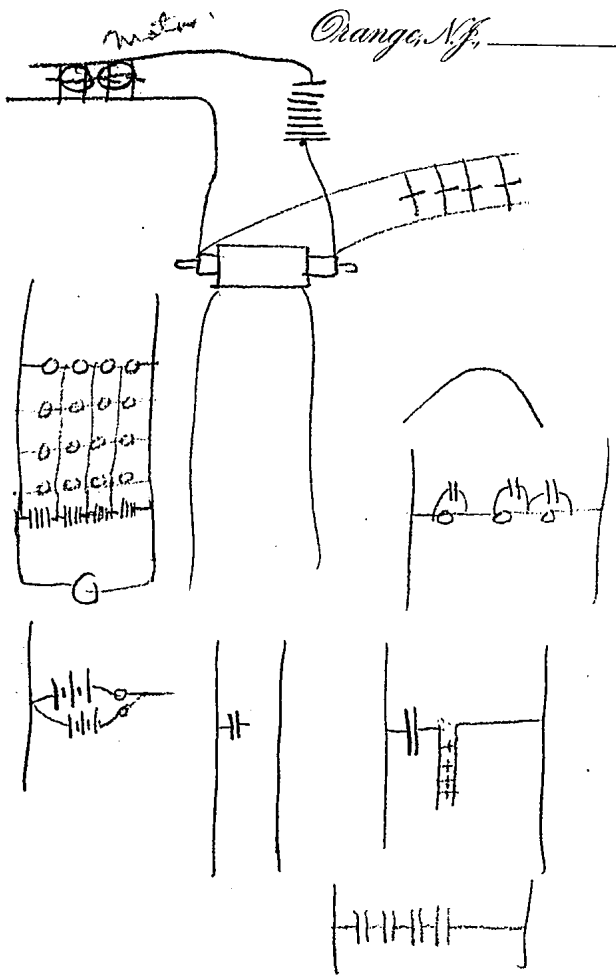
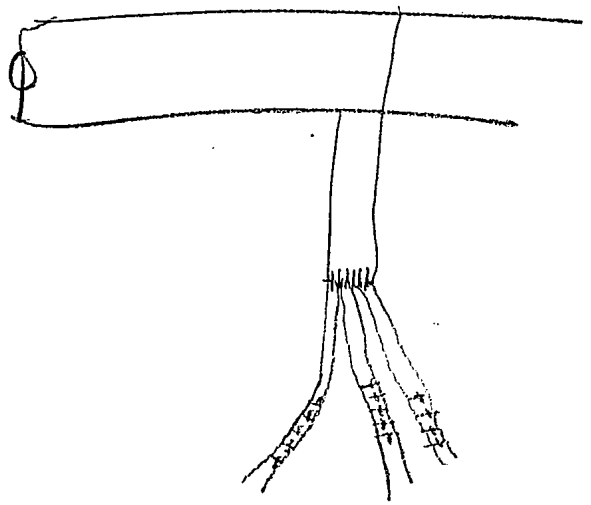
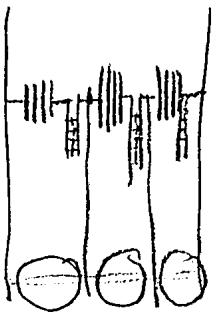
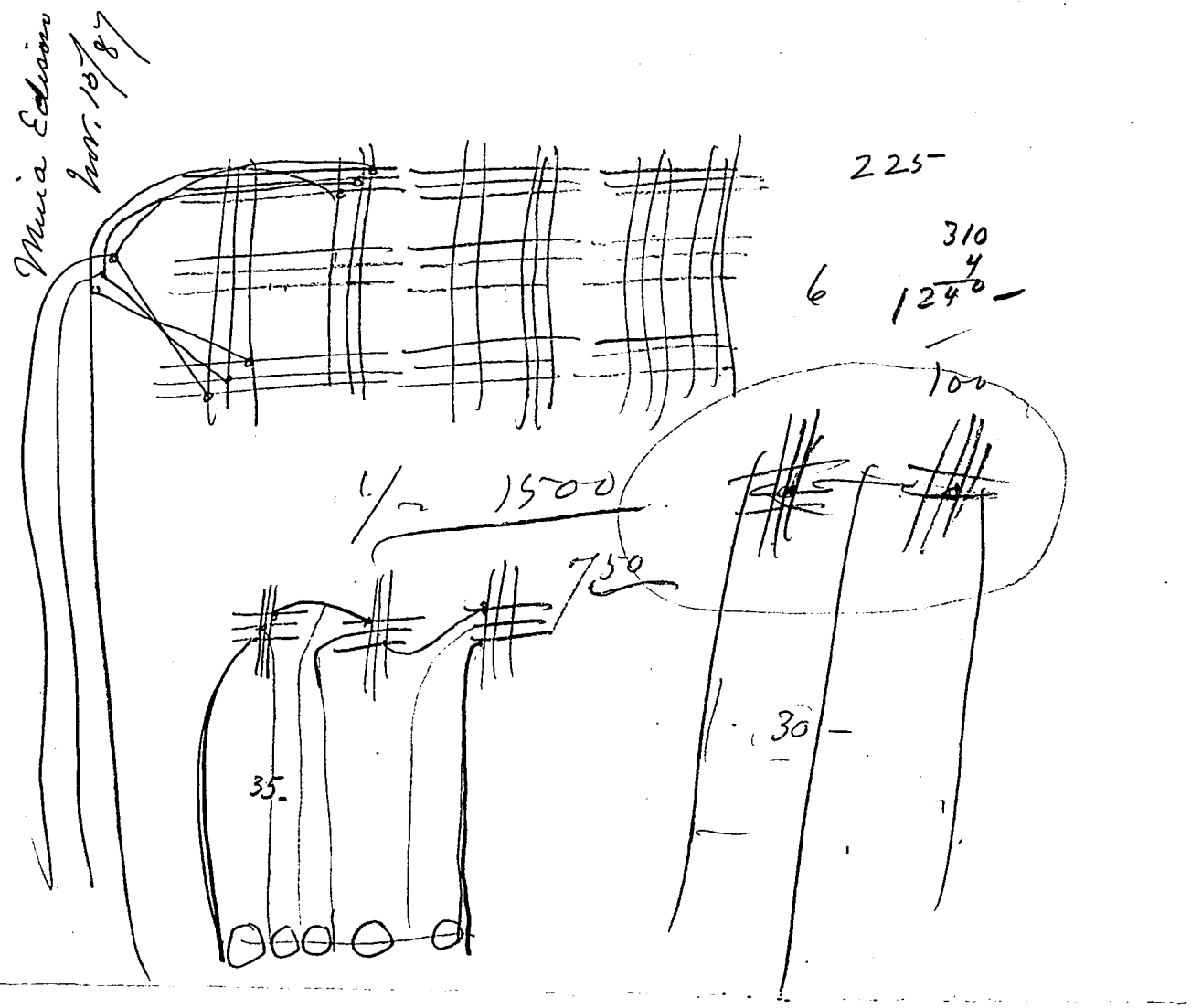


Mina Edison

Nov. 15/87






Maria Edison
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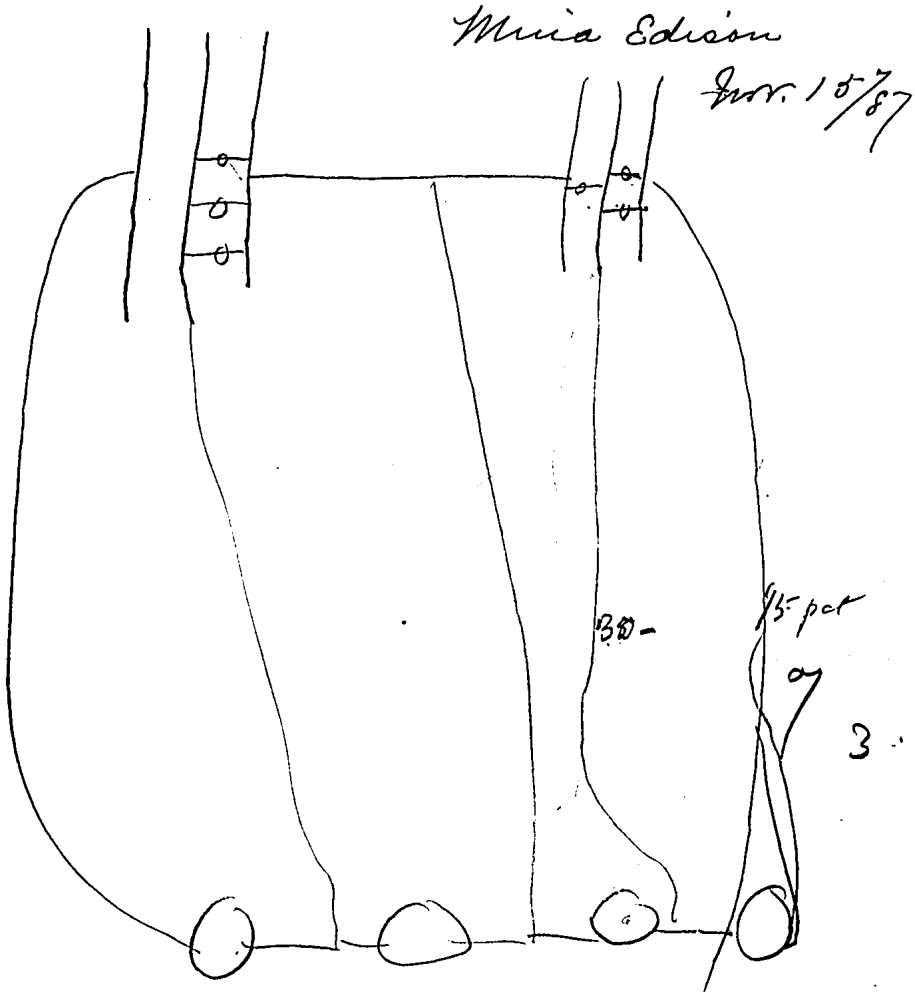
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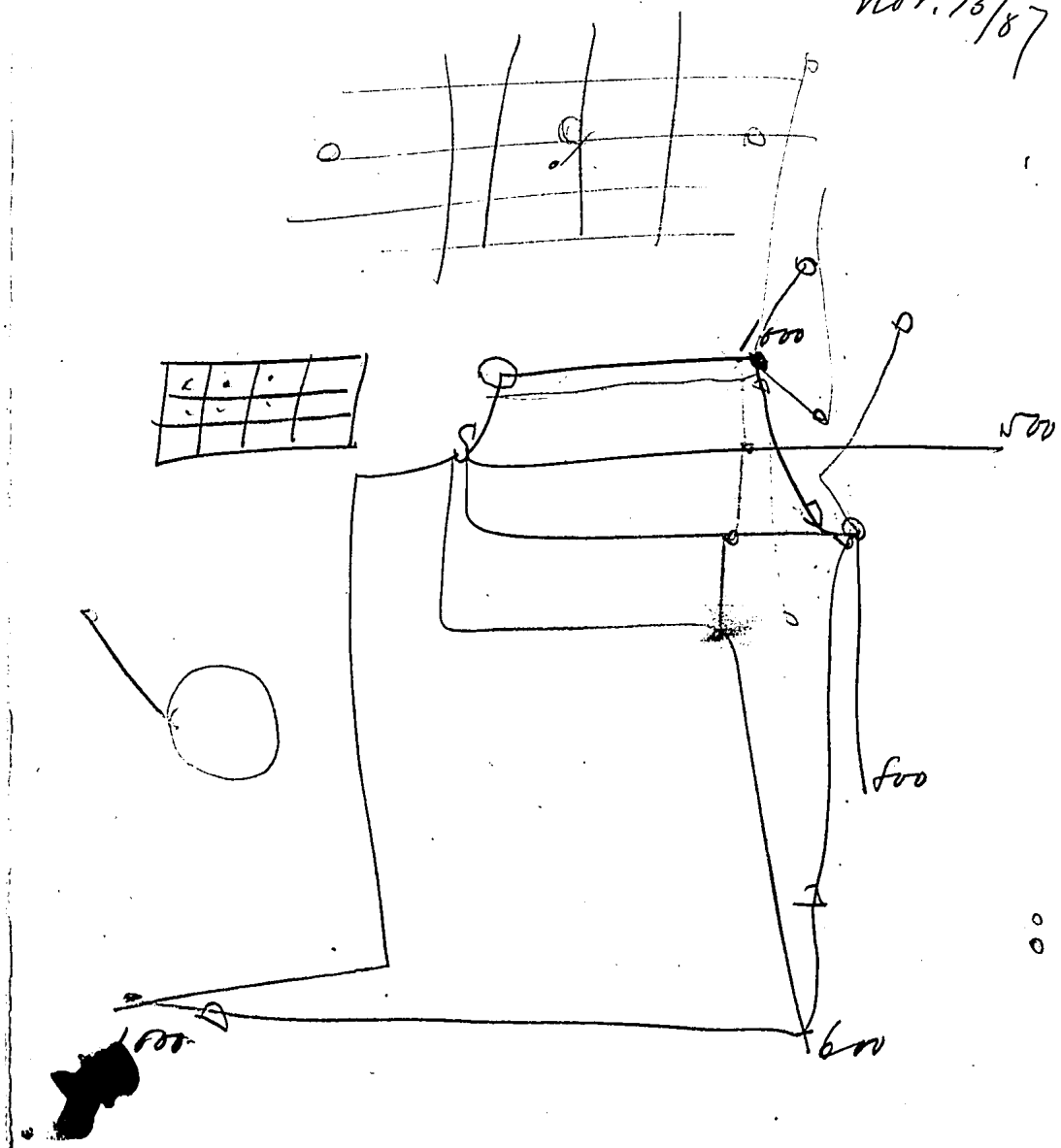
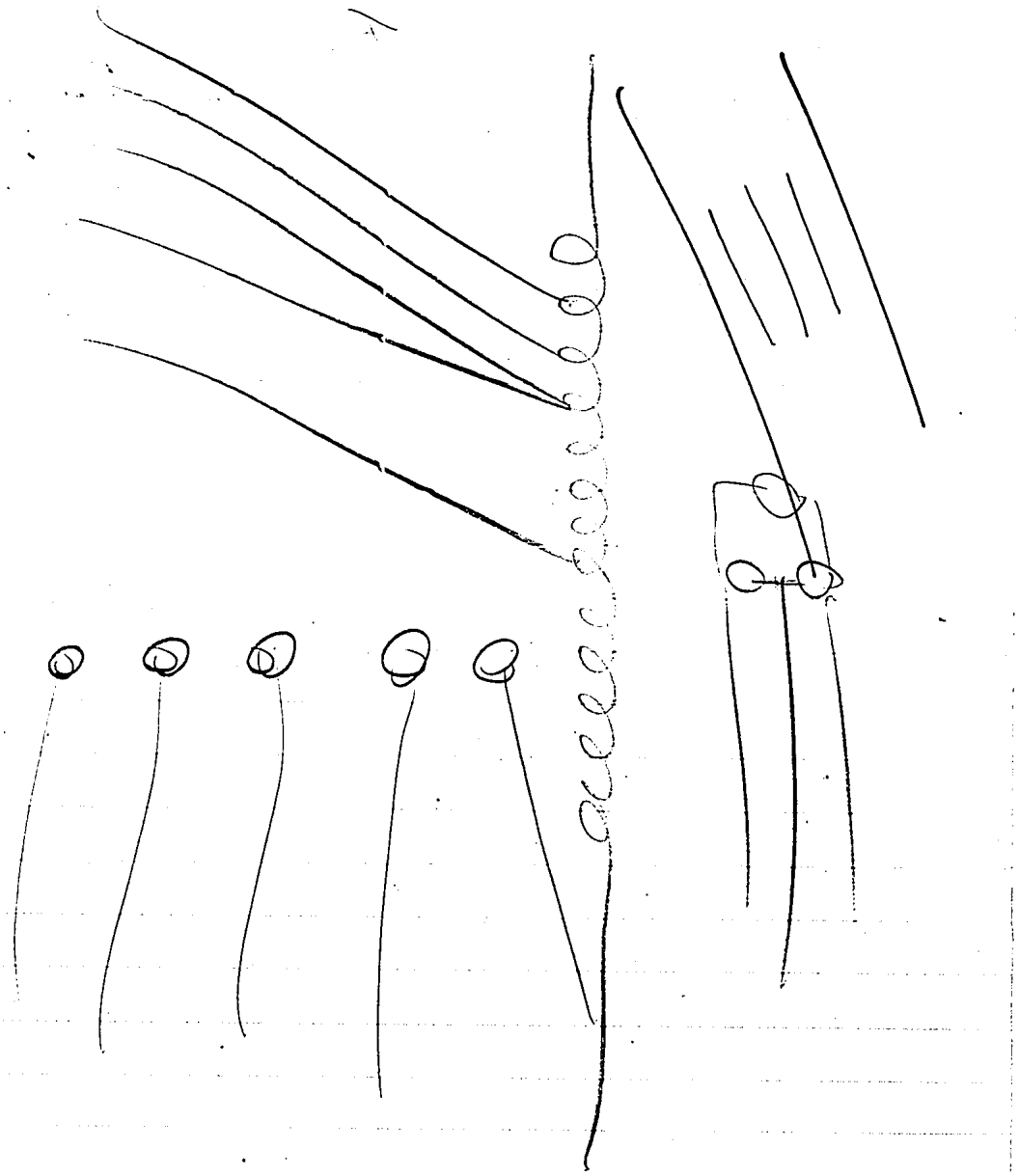
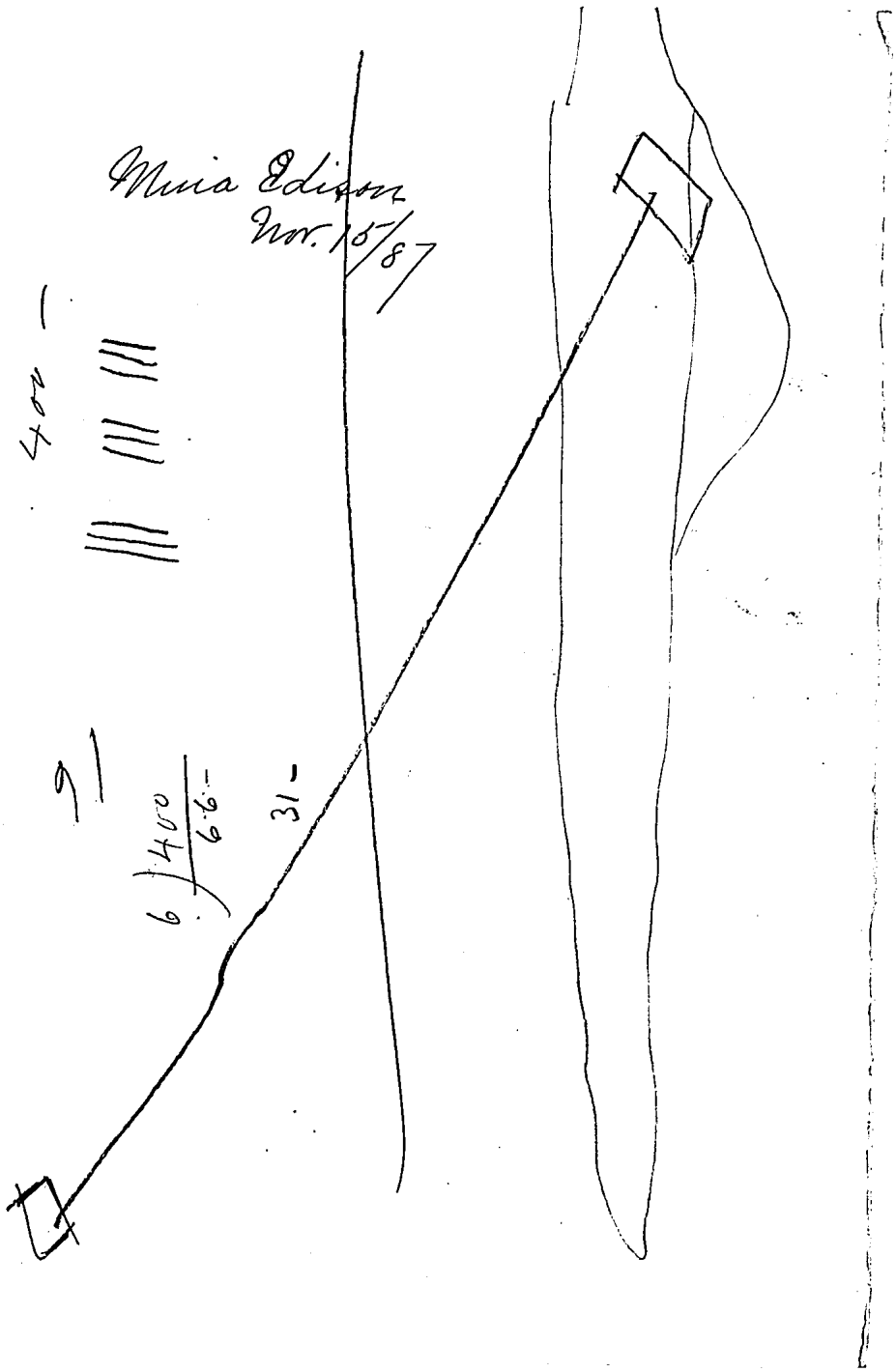
Thomas Edison
Nov. 16/87






Mina Edison
Nov. 15/87
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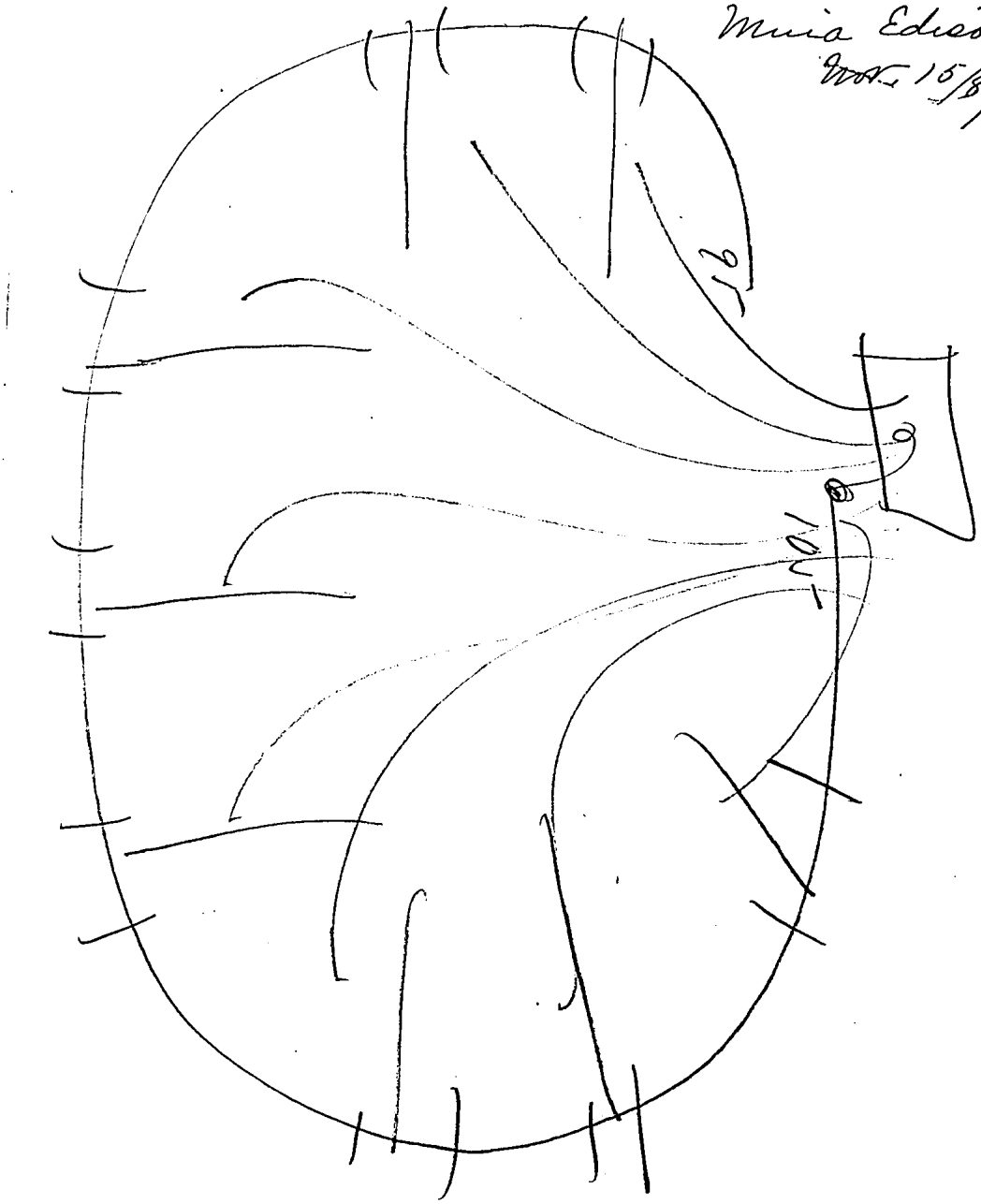
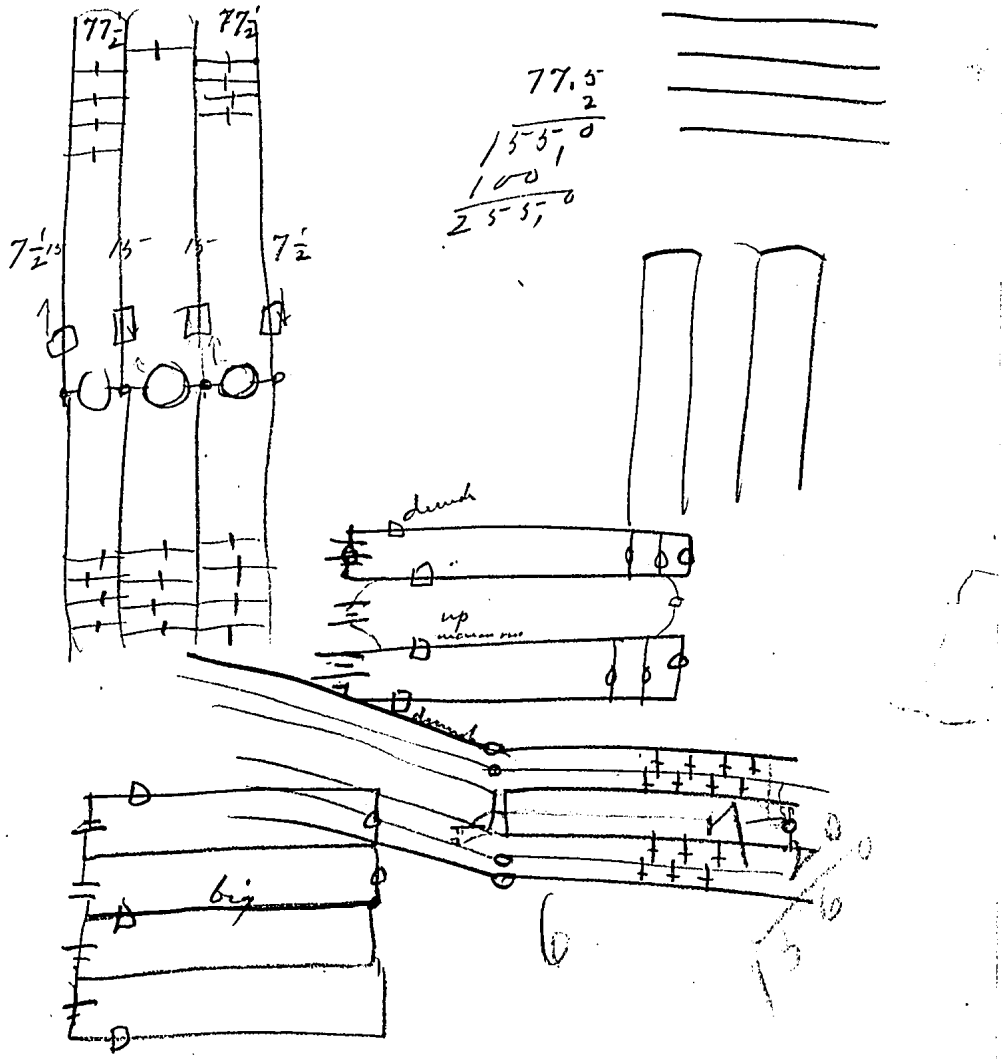

Mina Edison
Dec. 15/87

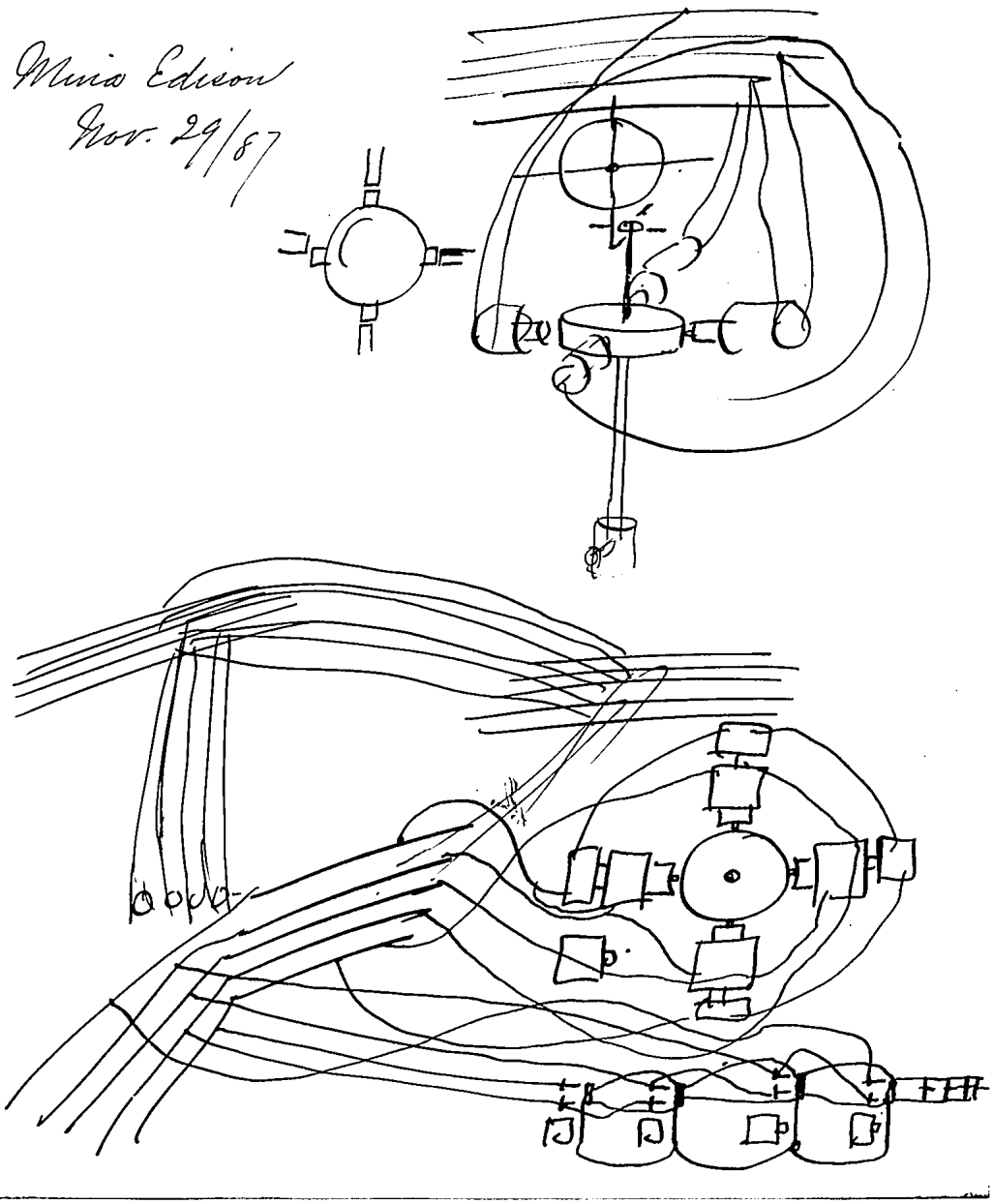
Cable Address "Edison, New York."

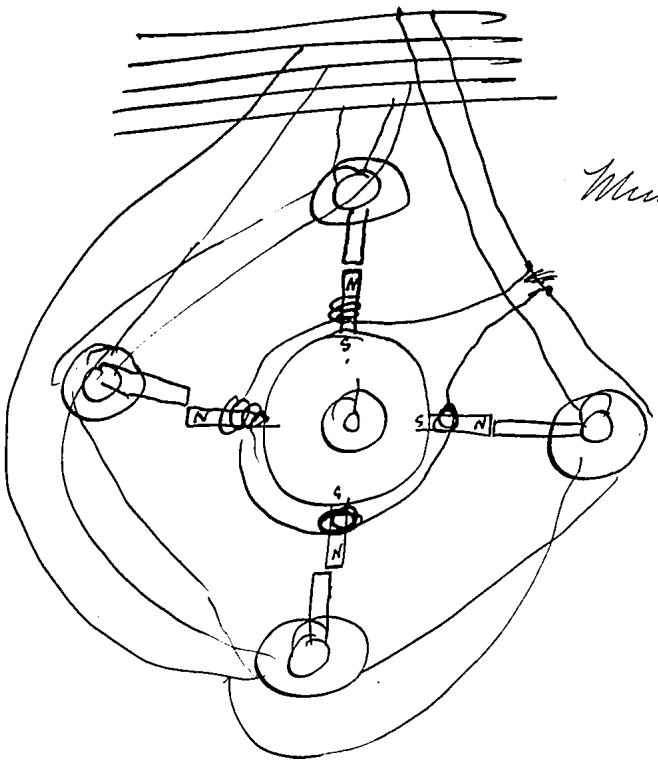
From the Laboratory
of
Thomas A. Edison.

Orange, N.J., _____ 1887.

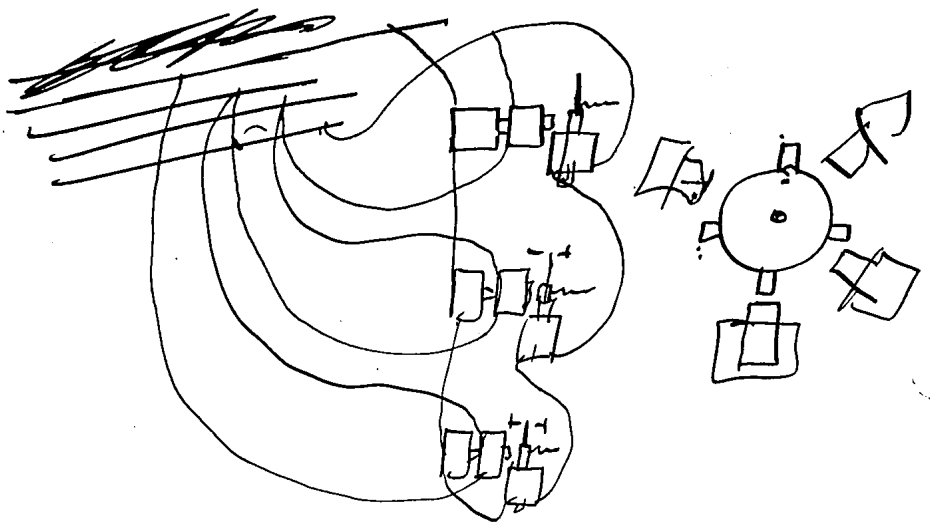


Minia Edison
Nov. 29/87

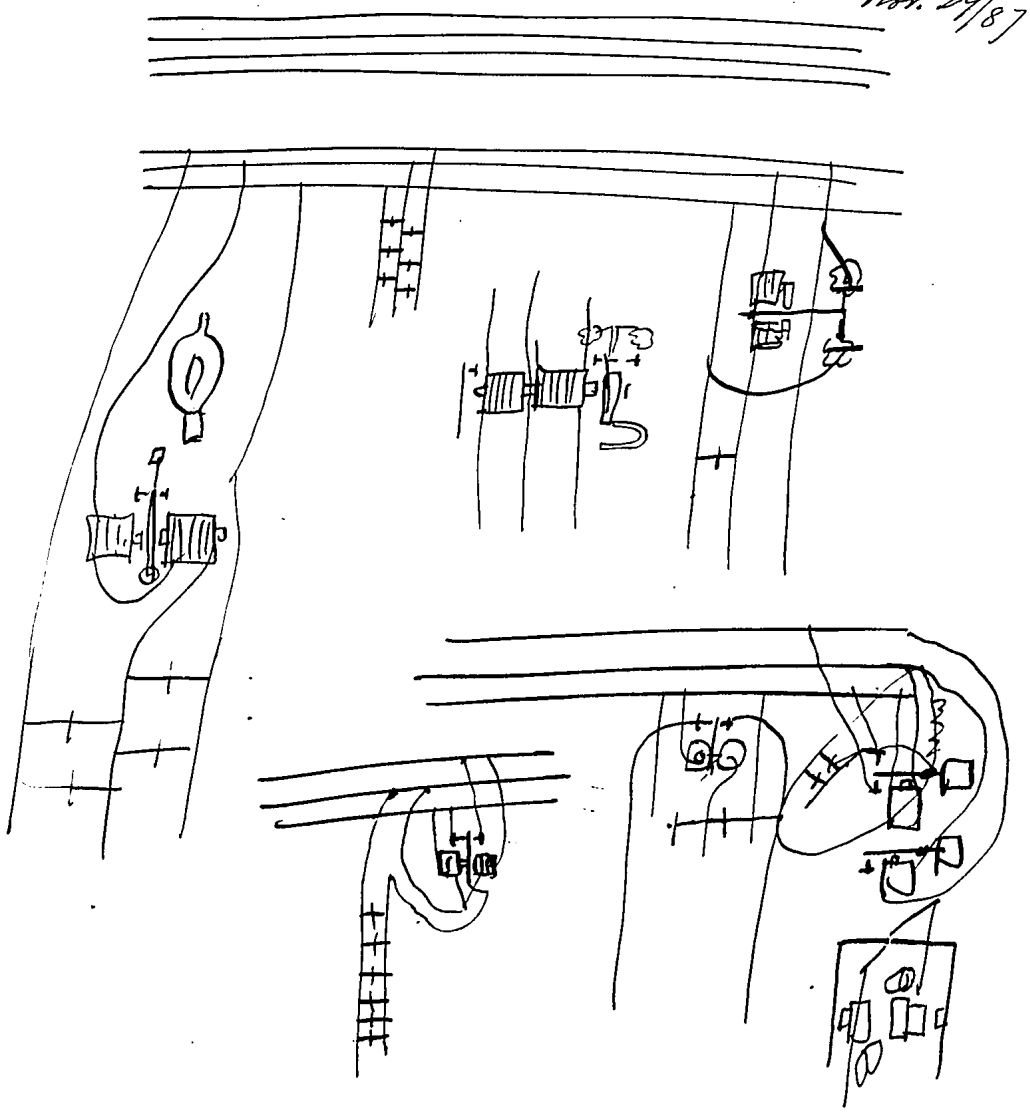





Minia Edison
Nov. 29/87



Menlo Edison
Nov. 29/87



## Technical Scrapbook, Cat. 1153

This scrapbook covers the period January-February 1888. The entries are by Edison. Included are notes and drawings relating to phonographs, ore separators, lamps, a pyromagnetic generator, and a telegraph recorder. The name of Mina Edison appears as a witness on some of the documents.

Received Jany. 6, 1888
Pelton & H. Dyer

Orange January 4 1888

Dyer—

Here is something new Prepare an Application Its on the line of the pyromagnetic Dynamo—

The object is to transform the heat Energy of coal electrically into Electricity without the intervention of a Steam Engine or other prime motor, The invention Consists in causing heat to expand rods tubes, sheets of metals or expansible material in such a way as to open & close a magnetic circuit, Which magnetic current is surrounded with a coil of wire upon which the lines of force acts inductively

The invention further Consists in arranging a number of such simple devices together to obtain Continuous Electric Currents by commutating, the Electric Current, & alternately cooling & heating a portion of the devices. Not Continuously

The invention further Consists in various details.

Many attempts have been made to construct prime motors by utilizing the Expansion & Contraction of solid matter, but the Expansion & Contraction between practicable limits is so small that mechanical means are of no avail to obtain motion sufficient for practical purposes, The problem is to get motion or Energy capable of use from the Exceedingly Small movement due to expansion, I have solved this problem and am enabled to utilize barely perceptable motion for obtaining Light & power for running machinery with great Economy of fuel, I have found that the resistance of air to magnetic lines of force or stress is about 1200 times that of soft iron, That about short magnets divided in two parts with their faces accurately ground to fit together like two surface plates and magnetized nearly to saturation can scarcely be pulled apart by the direct pull of two Oxen: but if the faces are seperated $\frac{1}{200}$ of an inch The attraction is reduced enormously on account of the sudden interposition in the magnetic circuit of a layer of air whose specific resistance to magnetic Stress is 1200 times greater,

If one ½ of the magnetic circuit be covered with wire it can be magnetized to saturation, while the other ½ being also coiled with wire, the coil will receive a powerful induction wave at the moments when the ~~force~~ of magnetic circuit is opened or closed $\frac{1}{200}$ of an inch or less. Which movement is produced by the Expansion of ~~stretched~~ metal. By this means I am enabled to obtain the full value of the almost immeasurable force of Expansion in solids for practical purposes

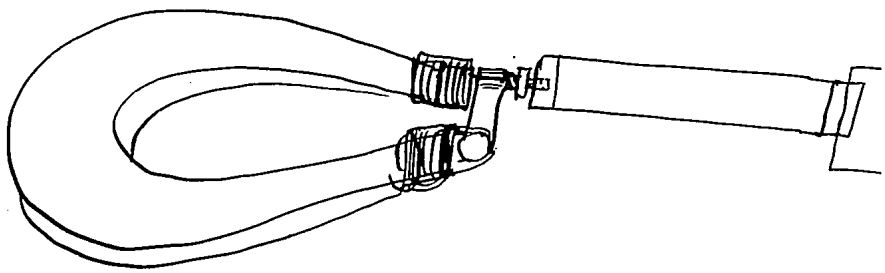
Fig 1 Shews one single unit of the Generator K K ~~with~~ are sheets of soft Nickel. secured to the End pieces H. I. & being secured to the Central hub M of the Generator. The magnet & Central hub are rigidly connected together by radial arms shewn by dotted lines fig 2 A is the magnetizing Coil. B the generating Coil The magnetic break occurs within the helix B at c, d. The part of magnet moveable ~~is fixed~~ has a bearing at N. F is a nut connected to a right & left handed tightening Screw for adjusting the

tension on the Expanding device,
Fig 3 shows a section of the Generator over a furnace. X fig 3 & 4 is the revolving grand plate Etc Dyer the action is the same as pyromagnetic Generator.
instead of having Commutator wheels right over furnace I use Spur gear & take the Coil device away from the heat, both shafts, making same revolutions allows me to do this
I have shown no smoke stack, or regenerative device's mention that these would complicate the description & will be the subject matter of small application.

When no heat in furnace the contraction of K.K. etc opens magnetic circuit & the charging of the magnets is insufficient to draw the circuit closed but when the furnace is started the heat soon reaches a point where the Expansion is just to allow closing whereupon we get a powerful inductive wave in B

Inductive magnet

By starting the ~~field magnets~~ with a small battery they may be made to build up & it may be discontinued. Of course horse shoe magnets can be used



Mention that I do not confine myself to sheets of metals for Expansion but tubes with thin walls, wires and other forms can be used — fig 6 shows

The method of using liquids the Expansion being produced by hot water or steam through copper pipes coiled in a small closed chamber with proton, the coils being immersed in the liquid used

a number of fig 6 being arranged
with a rotating wheel which serves to
open & close the steam Cocks of the
various devices successively. The details
of which will be shown in another application

Dyer- I suppose we had better call this
the Dynamo-magnetic Dynamo, (1st) Improvement
—

Very broad Claims ought to be obtained
The only instance where currents have been
generated by breaking actual contact between
iron & armature is in the Breguet Exploder
but this was done by hand & moved an inch
or more, doing it through infinitely small
Comparatively
distances by Expansion is I think entirely
new, The use of a magnetizing coil is new
The arranging with Commutators is new.
The devices are new, The Magnet Expansion device
with mag is new all the devices are new
Let me see what you can do —

Edison

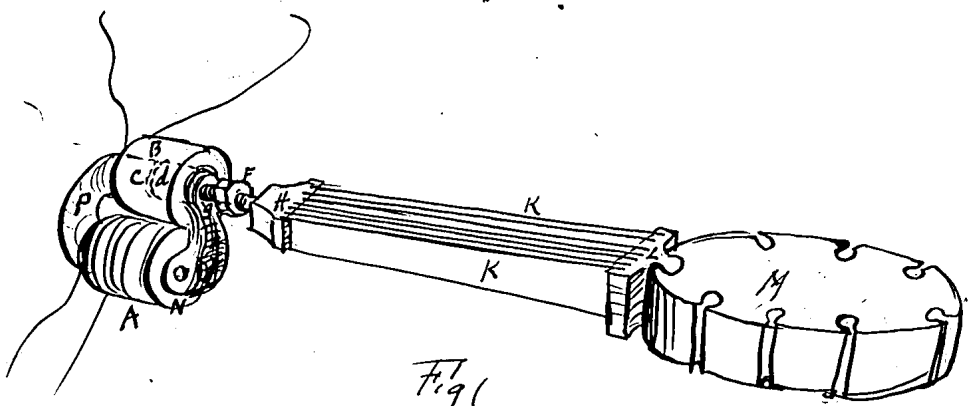



Fig 1

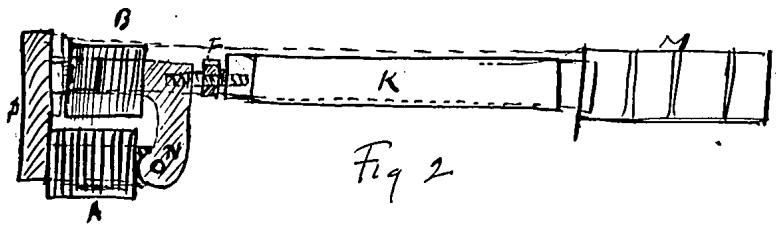



Fig 2

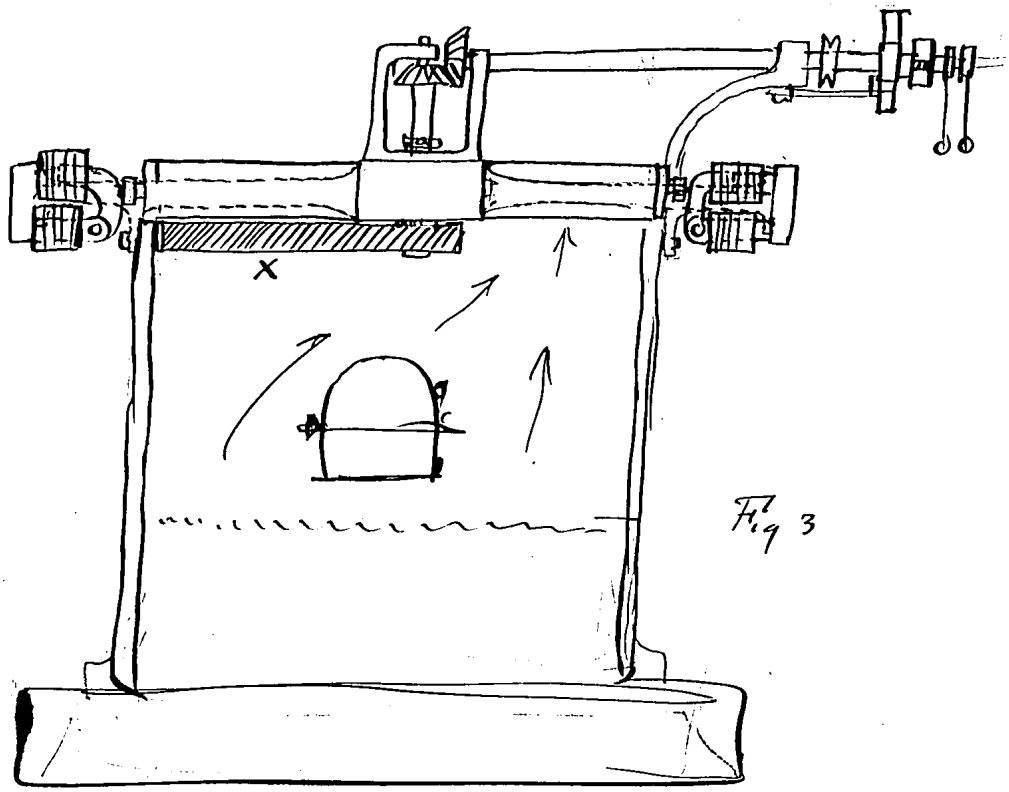



Fig 3

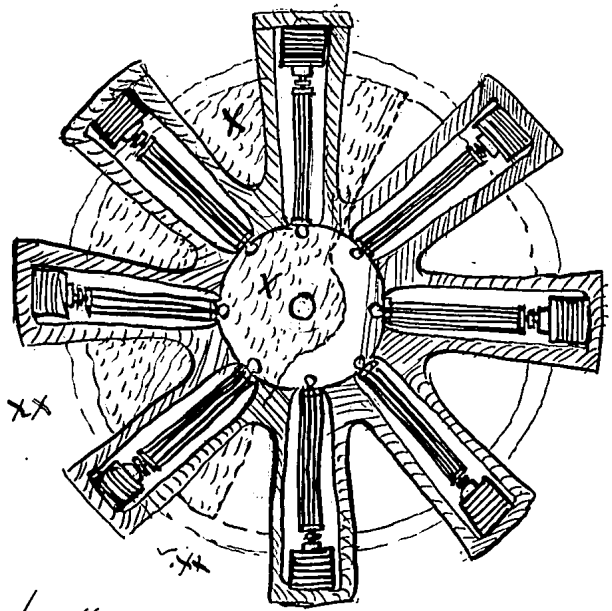


Fig. 4.

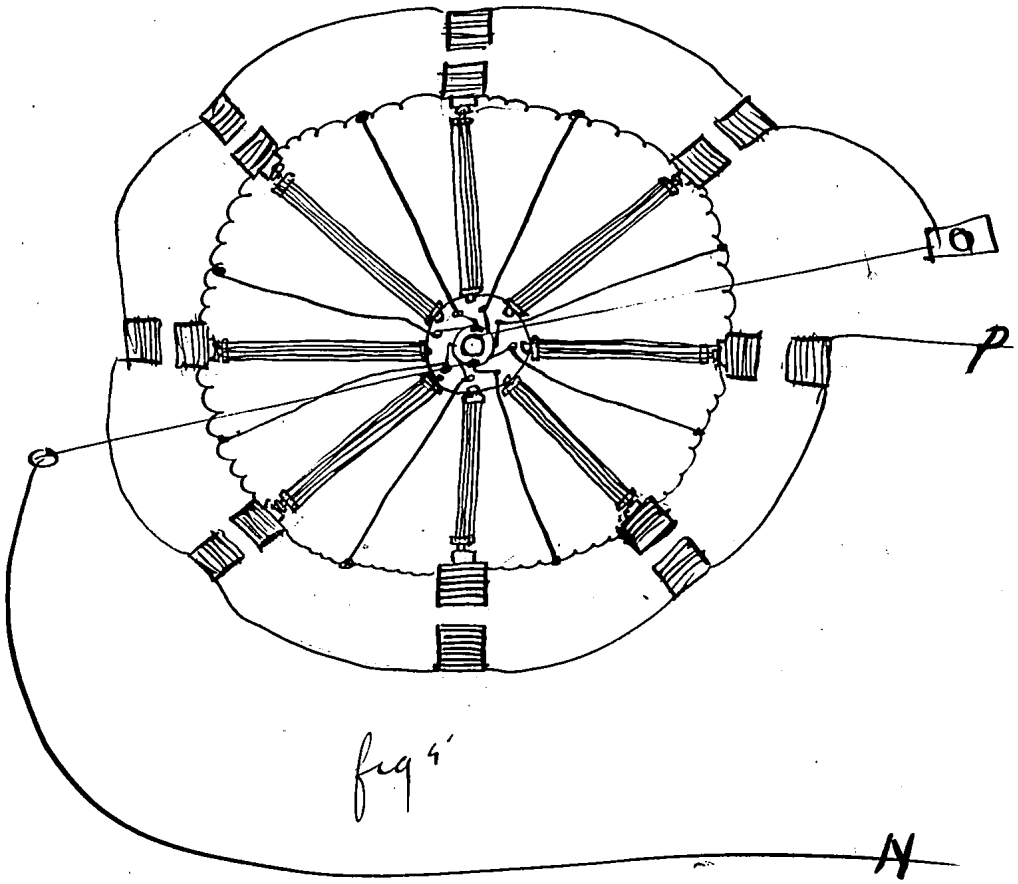
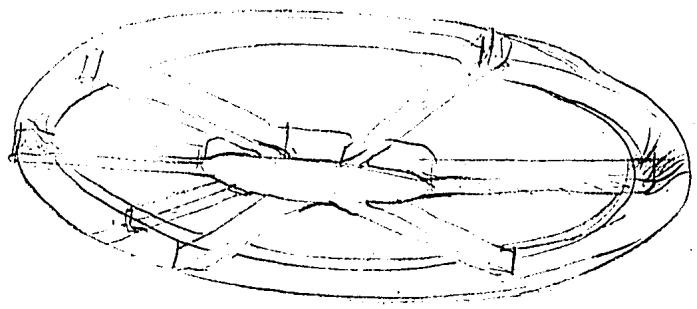
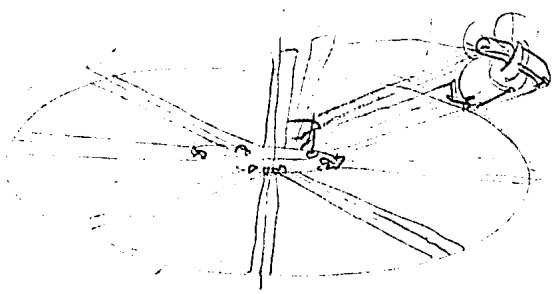



fig 4





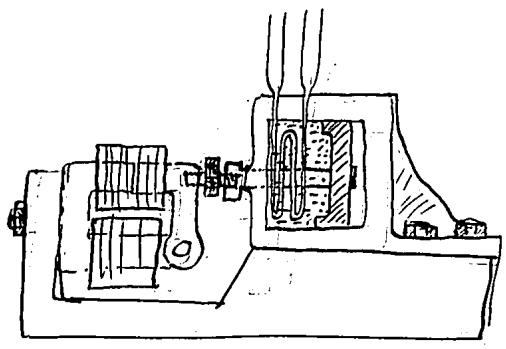


fig 6

Rec'd Jany 18 '88.
R. N. Dyer.

Orange N J Jany 17/88

Dyer Patent,

The object of this invention is the economical production of perfect Phonogram Cylinders —

The invention consists in the method of moulding the same and finishing to a perfect article,

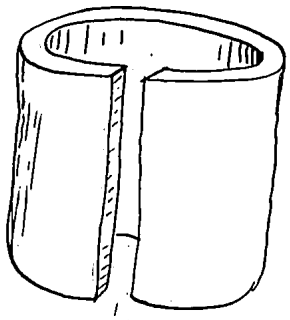
Cylinders formed of Waxes, Gums or mixtures of the same when poured from a melted state into a moved contract enormously in Cooling especially those mixtures suitable for Phonogram Cylinders hence it is a very diffrent matter to moved hollow tubes or Cylinders wholly of ~~the~~ such material, The great shrinkage causing the same to Crack notwithstanding the various devices Employed — The moulds are also complicated & Expensive and experts must be Employed

To abviate the great expense for apparatus and to produce cylinders of great perfection, I divide the circumferential Continuity of the cylinder by a narrow strip placed in the mould, on pouring the liquid in the same the same is not continuous around the circumfrem on cooling. instead of the cylinder contracting inwardly & thus cracking it contracts both directions from the dividing piece, ~~What~~ without the slightest danger of distortion or Cracking. It may be left to cool in the mould. When cold the ~~cylinder~~ shell has contracted in thickness sufficently to be Easily removed from the mould. As it comes from the latter there is an break of about $\frac{1}{4}$ of of an inch generally due to contraction, The Cylinder is then put on a mandril or cylinder of metal, Tapering until it fits. End pieces are fitted at the Extremities of the break. This break is poured full of

hot wax which perfectly fuses to the Edges of the Break, quickly cools & the Cylinder is made continuous and ready for the shaping Lathe. The Cylinder is clamped Lightly in a Chuck & a Cutting tool set on a taper bores it out to a uniform taper corresponding to the taper of the Cylinder of the phonograph afterwards. The Cylinder is placed on a Mandrel & its face is turned off true. The phonogram blank is now ready for use —

Will it be necessary to take out 2 patents. This is good thing so draw broad claims These terrible contractions dont seem to have been encountered in any other industrial operations,

Edison



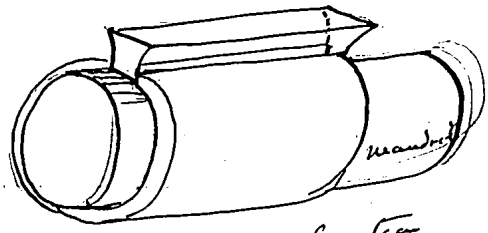
1st Operation

break

dividing piece

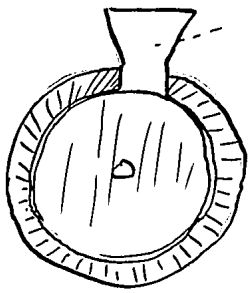
outside of mould

inside of mould




2nd Operation

pouring funnel



Received January 13 88
Edw. H. Dyer.

Orange N.J. January 10/ 88

Dyer Patent,

Improvement in Thermo Electric batteries

Object of the invention production of Electricity direct from heat,

Invention consists in rotating or moving the two Thermo electric metals

2nd Consists in heating one Element direct to a high temperature while the other is only heated by Conduction,

3rd Keeping one Element at a high temperature at its Contact Surface & the opposite metal at a low temperature where the two come in contact & maintaining these great degrees of temperature Continuously of

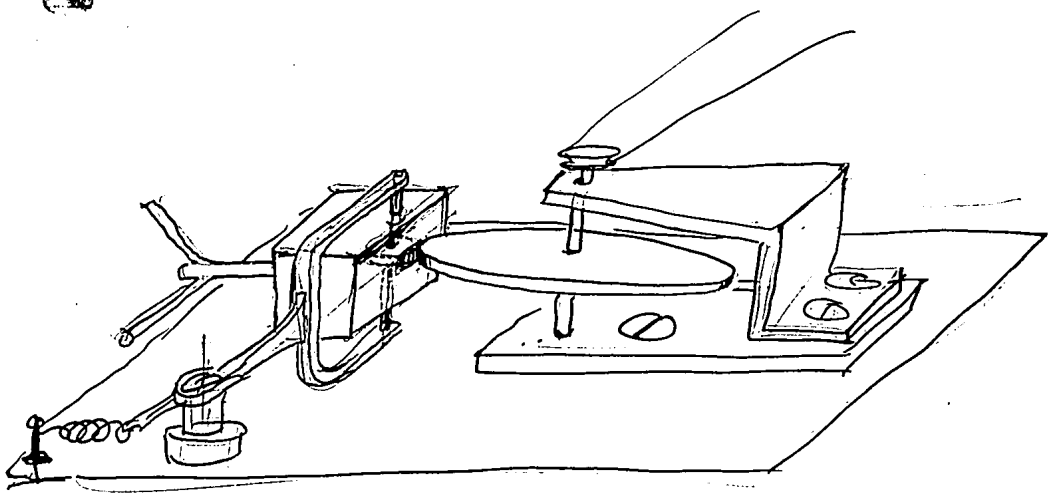
~~Both Current Electromotive force depends upon the difference of Temperature~~ The small wheel is of Copper the large of Iron a blowpipe flame for Illustration Keeps the Copper wheel red hot, while the iron wheel being a poor Conductor of heat & being Exposed to the air while in rotation remains Comparatively Cool. any loss of heat from the Copper wheel is continuously supplied by the flame The large wheel is run by an Electromotor supplied by Current generated or by other motive. The small Copper wheel being in bearings on a moveable arm is held against the wheel with Considerable force & no Coil is with it = Spring Contacts serve to make good Contact with the Respective Shafts -

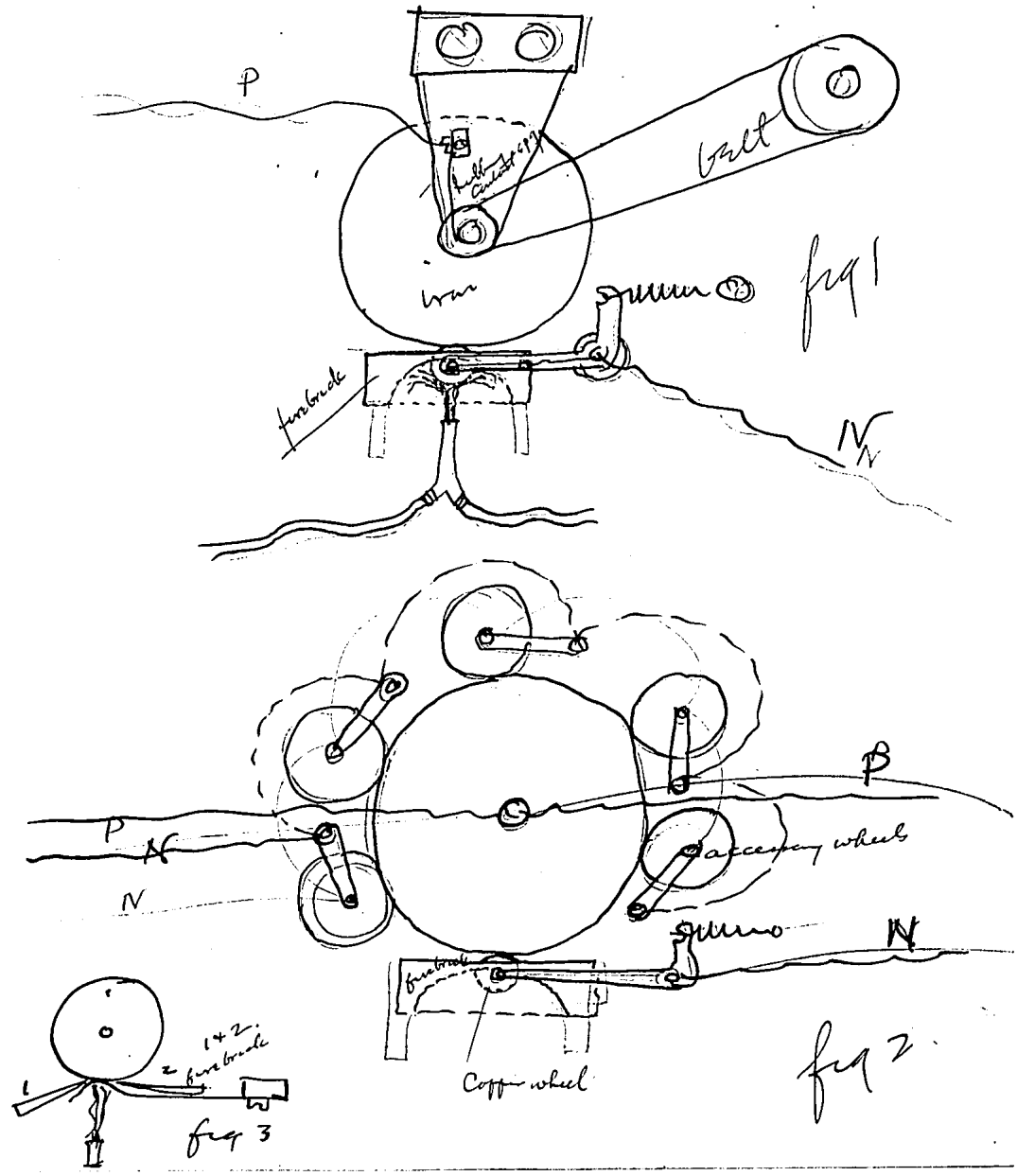
fig. 2. Shows general accessory wheel of Copper which are not heated but serve to keep the commutator wheel cool at the same time generate a current while Cooling which can also be utilized but which is small Compared to the Current from the heated wheel - It is obvious that many modifications can be made and that any of the suitable Thermo Electric metals may be used, The application of this invention for Various purposes will be the subject matter of other applications -

Dyer. rotating or rubbing Thermo surfaces is I think new 2nd Heating one continuously & keeping the other at a lower temperature at point of Contact is new / fig 3 Shows rubbing Contact heated on one side & arranged so flame or copper not in Contact doesn't give heat to wheel by conduction or radiation.

This arrangement gives 35/40 of a Volt - T.A.E.

Claim Everything within as about patents




P
belt
fig 1
fore brake
IV
P
P
IV
P
catching wheel
IV
fore brake
Copper wheel
fig 2
1+2
2 fore brake
1
fig 3

Recd Jany 18, 88 H.W. Ley

Orange Jany 14 1888

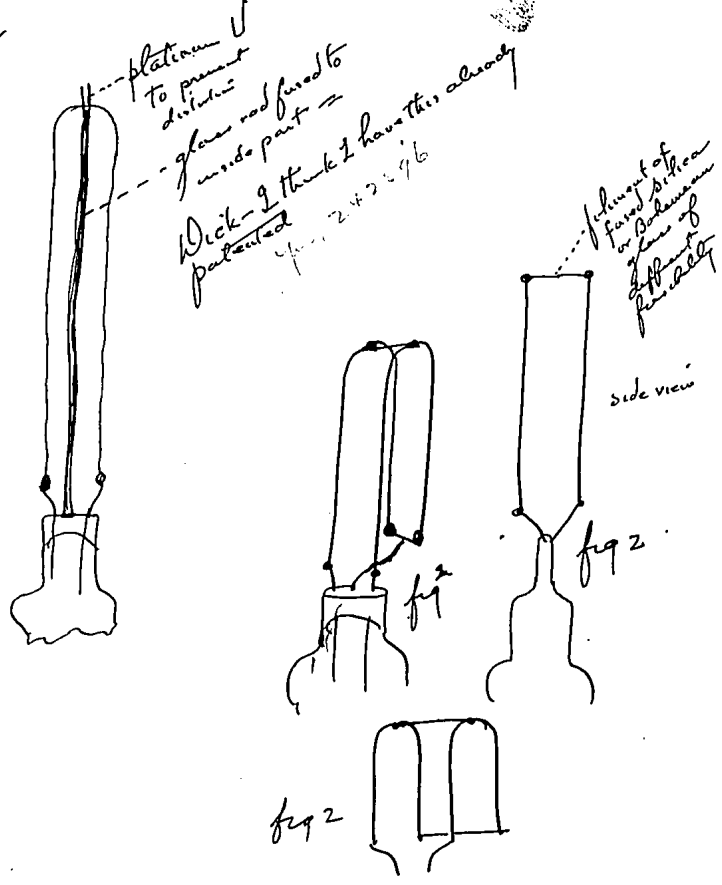
Dyer Patent.

The object of the invention is to construct incandescent lamps of a candle power generally in use 16 candles of very high resistance, so that high electromotive forces can be used and thus diminish the investment in the Copper Conducting cords as the manner how very well known.

The invention consists in the employment of an angle very long thin filament of Carbon supported in the center of its incandescent part or the use of ~~two or more~~ two or more filaments ~~at two or more points~~ & causing them to be ~~at one point~~ mechanically connected to ~~there~~ one another by a new conducting medium.

It is now well known that there is a very considerable attraction between the Electrified surface of the glass globe and the filament which of course is charged statically in the opposite way and this tends to draw the filament if very long & flexible towards the glass. ~~rotating it~~ in many cases causing the

filament to touch the glass when the lamp is destroyed, On the other hand when we ~~destroy~~ put two filaments in the globe the mutual repulsion & attraction of the currents traversing the filaments increases the distortion. The aspect I have in view is the prevention of this distortion,



These filments of insulating material are secured to the carbon by a carbon paste, filments of pure Silica melted by the Oxyhydrogen blowpipe — ~~Asbestos or thread of Asbestos spun~~ or the most infusible bohemian glass can be used without danger of melting. The small quantity of Carbon paste at the junction of the filment of carbon & thread of insulating material serves by its increased radiating surface to reduce the temperature at that point below the fusing or softening point of the glass —
The form I prefer to use is this

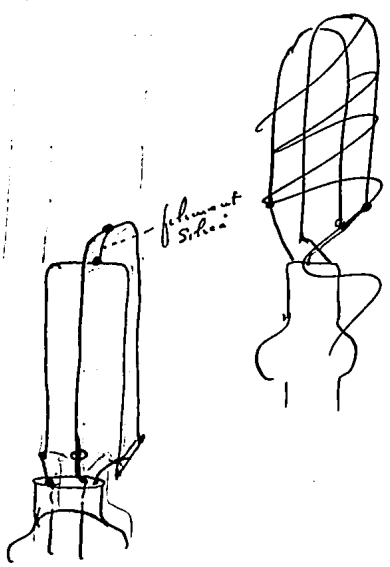
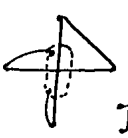


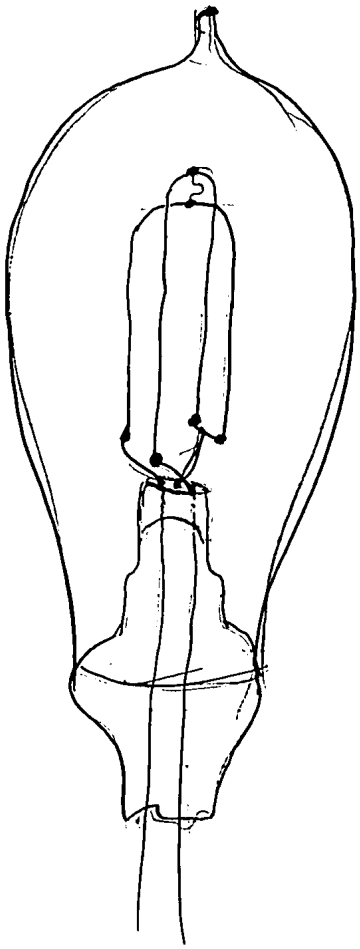

fig 3

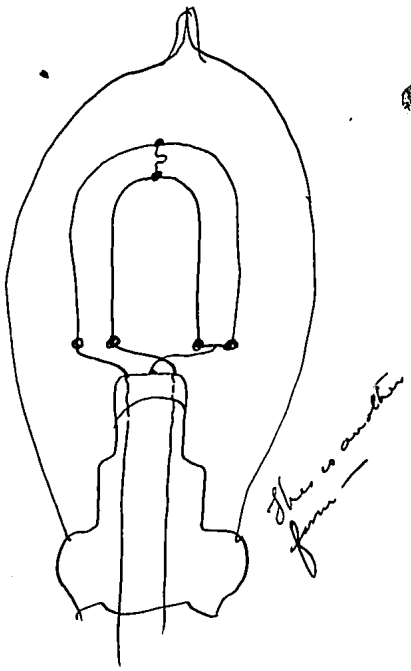


Top view

filments at right angles one 3/16 inch longer than the other & connecting thread between

This makes a very stable Combination,






This shows to Getter, the filament of Silica is bent ⅄ to allow of Expansion

These various forms Especially figure 3 gives a very pleasing form of radiating Surface very much superior to the method of getting a long filament by Coiling as is sometimes done another advantage over the Coiling arrangement is that the filament is not unequally heated by radiation from one spiral to another, that Better filaments can be made in the Carbonizing process with filaments not coiled,

Make good strong Claims in view of what I already have -

Claim the mechanical non conducting support for holding two or more filaments to prevent distortion. The Right angle arrangement. The use of a paste in this connection -

Now Dick here is a fine point. No one but myself has Ever constructed a lamp giving 200 Volts across its terminal within a single Vacuum Chamber.

.. All makers used flashed Carbons, this would bring Volts down to 125 or so by using an unflashed Carbon I can use 200 or more, No one before myself has ever used two filaments to get 16 Candles of unflashed Carbon in one Vac Chamber - Nor one has ever been able to make a 16 cp lamp requiring 200 Volts to give 16 Candles —

Isn't it possible to Cook up a claim that will hold Lamps of this Character — Think it over + let me hear from you —

E

Recd Jany 1888
R. N. Dyer

Patent - Orange Jany 17 1888

The object of this invention is to produce a good material for the Phonogram Cylinders which will give Loudness & clearness of articulation. + freedom from excessive ~~no~~ scraping sound. I have ascertained from a large number of experiments that to obtain these results The ordinary waxes of Commerce are not sufficient. They ~~cake too hard or too~~ mostly too soft; ~~or to soft to~~ and it is essential to use a hardening material mixed with them. For the purpose I have discovered that Carnauba Wax is the best hardener for mixing with the various soft waxes, and it may be used in various proportions up to the point when it is such quantity as to cause ~~excessive~~ scraping sounds. Carnauba Wax itself is very hard & brittle + utterly unfit for material for phonograms. ~~Ozokerite~~ The various qualities of Beeswax Spermacet, Cerosin may have from 10 to 50 per cent ~~or~~ of Carnauba Wax mixed with them

without practically increasing the scraping sounds in the phonograph The increasing percentages continuously increasing the volume of sound clearness of articulation & Convenience of turning off the face of the cylinder up to the point where the Carnauba Wax is in such Excess as to evince its presence by Scraping sounds, Some waxes such as paraffine cannot be made to disguise the hard scraping Sound producing properties of Carnauba, But Beeswax perfectly disguises it up to 50 percent or more according to the temperature of the phonogram cylinder when manipulated The percentage of Carnauba wax to be added will depend on the shape of the recording point. If very fine a large percentage can be added than if not so fine, I do not wish to confine myself to any particular proportion of Carnauba with the other waxes as they may be varied & produce proportionate results according

to the character of the phonograph
in which the cylinders are used -
I desire to claim the use broadly
of Carnauba ~~or similar wax~~ wax, or wax of like Composition as
a general hardener of the aforesaid waxes
for phonographic Cylinders

Edison

Feby 22 '88

Layer

Change the Kneading cephealmthus

after phonogram is ready deposit with Silver in Vacuum or graphite Electrolytic process. then plate with lead or tin, about 1/16 inch thick. dissolve out wax saw the cylinder through once so it can be bent flat. It is then bent around a cylinder and secured to the same by cement, forming an Endless or it can be kept flat and the cylinder to be reproduced passed over it like a lithograph press roller. = The latter preferable method =

Edison -

Clara. Alpha Centauri Orion the pole star — —

Rec'd Feb 29, 88

Feby 27/88

The object of this invention is to improve the methods of separating magnetic from non magnetic particles.

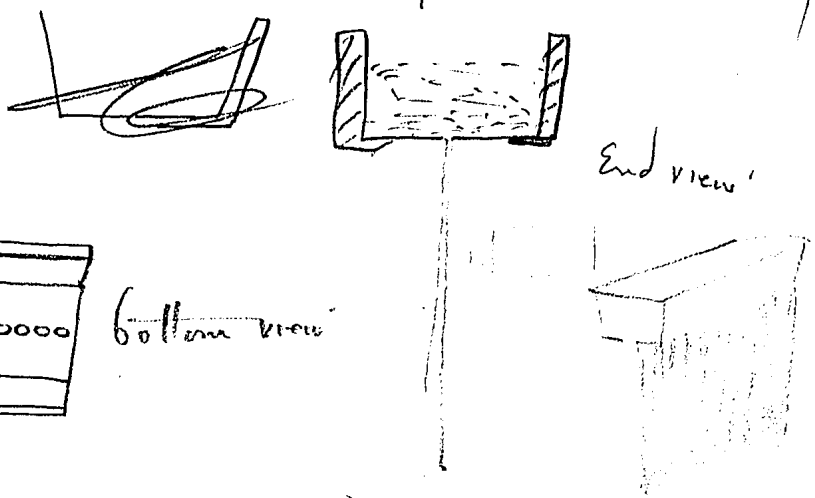
The invention consists of a peculiar delivery hopper which permits the powder to fall straight and not be spread out into a wide stream

Heretofore in Magnetic or other Separators V shaped hoppers have been used with a narrow slit at the bottom, The particles are thus given an angular motion The result being a stream of particles which widens greatly as it falls

This

This makes it very difficult to separate the magnetic from the non magnetic by alterations of the Trajectory especially when the material is very fine as in amiferous pyrites

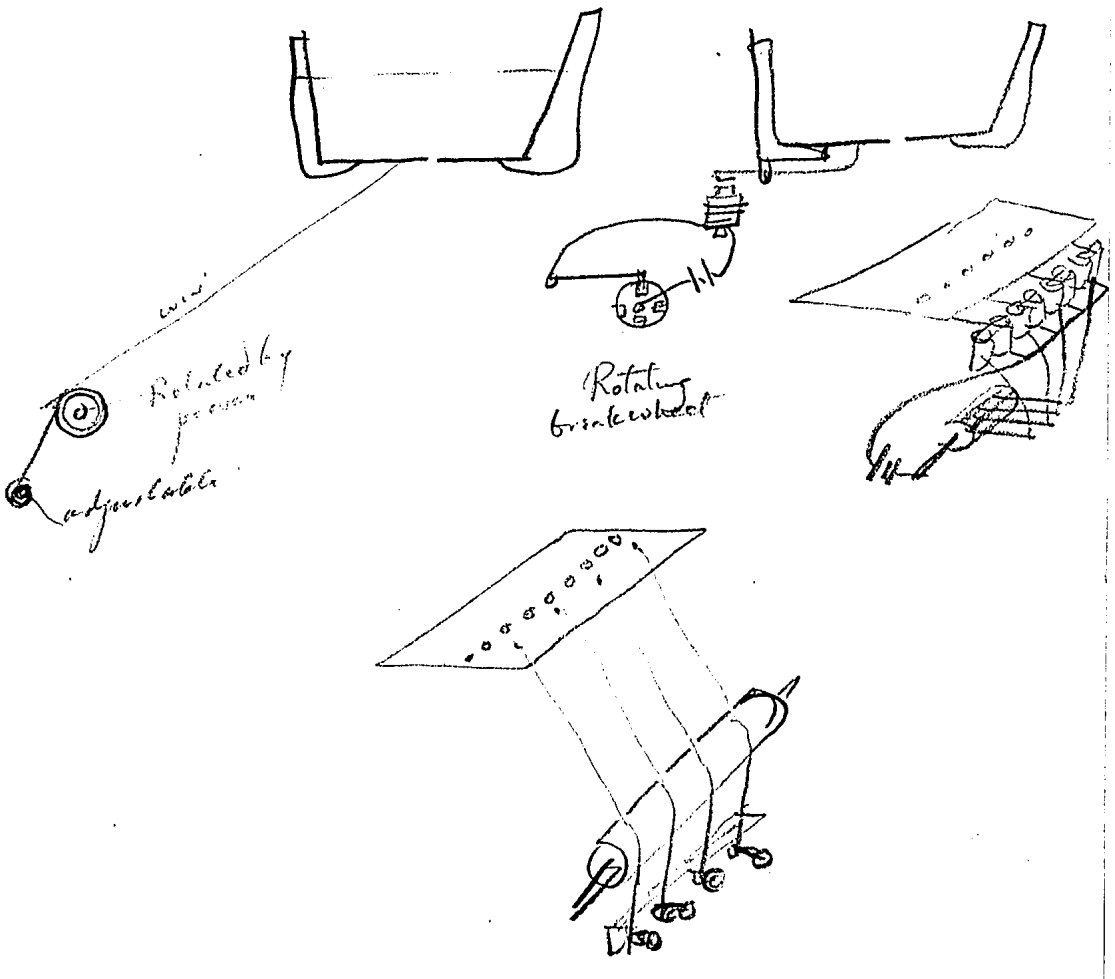
I have found that the stream can be almost prevented from spreading by the following device.




If the hopper be kept filled the particles leaving the thin sheet brass by the holes fall perfectly straight and continue so for a foot or more but gradually spread out by action of the air — The space between the holes causes the whole stream on its first start to appear as a number of streams but at some distance from the hopper these coalesce & form one sheet. Thus the particles are all widely separated from each other which is very essential for perfect separation when the largest portion of the material is magnetic.

When the ore or material is very fine & a very fine sheet of falling particles is essential the holes must be very small say for 100 mesh material the holes should be 3/64 of an inch and 1/32 apart, when this small the powder will not pass through. To obviate this the brass plate is made to receive vibrations like the vibrations of a phonograph diaphragm ~~of~~ or a plate bowed by a violin bow. This acts the particles of vibration & the pass freely through the holes, This vibration can be produced by a series of levers connected to magnets or by wires connected to different parts of the hopper plate, These wires receiving longitudinal vibrations by passing over a revolving wheel covered with leather & surfaced with Rosin -

See Cuts,


Rotating
Rotating

Dick—

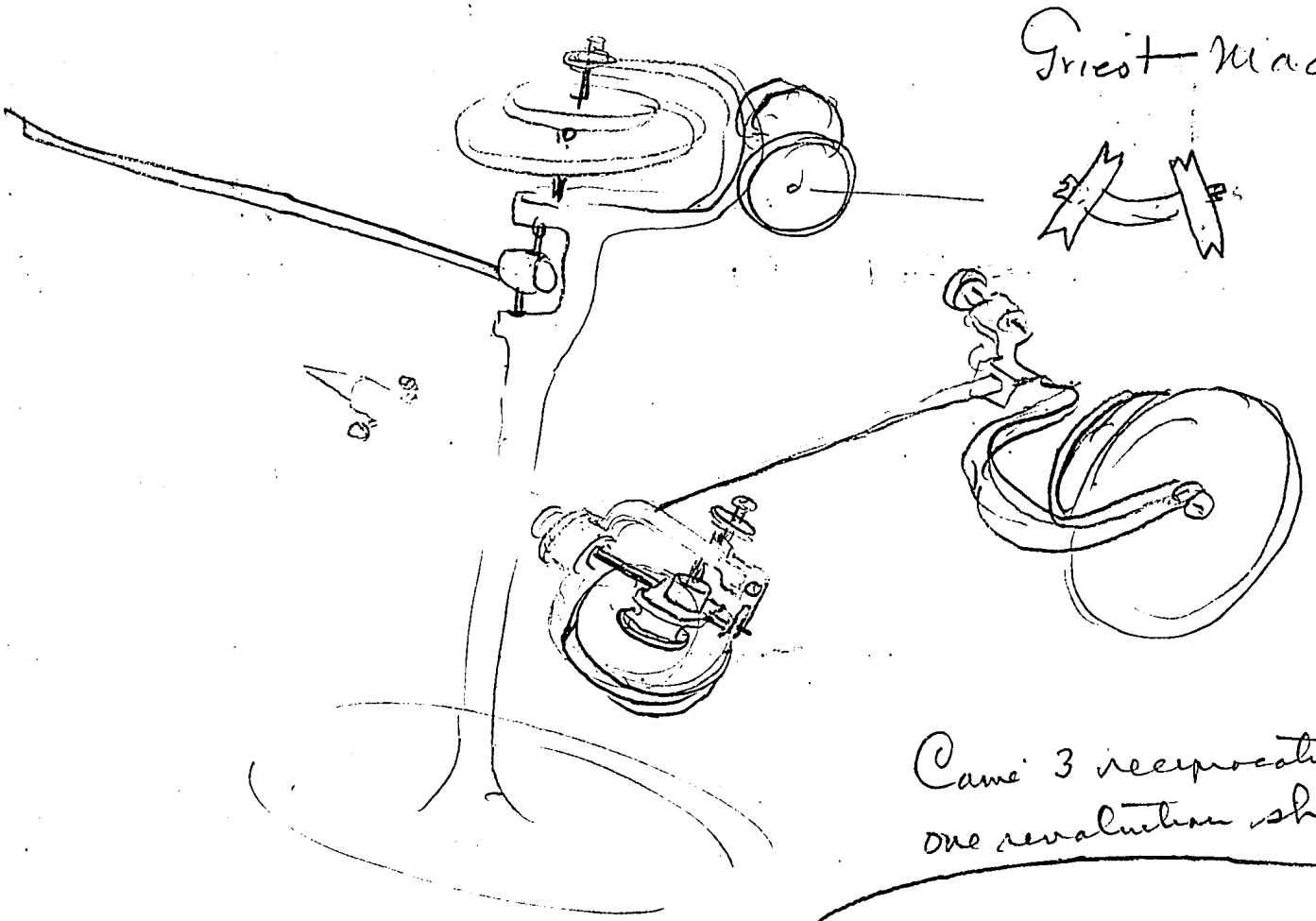
5

This is a real big advance
Cover it up as much as possible.

Edison

P.S. a straight slit 3/64 wide
can be used just as well as
the holes, but the stream is
thicker edgewise and does not
give so perfect a separation
as particles are closer together
to one of the magnetic particles
lock the rows together when in
close proximity to each
other — still the slit is good
so dont confine it to holes

Grist Machine.



Cam: 3 reciprocations to one revolution shaft

Copy.

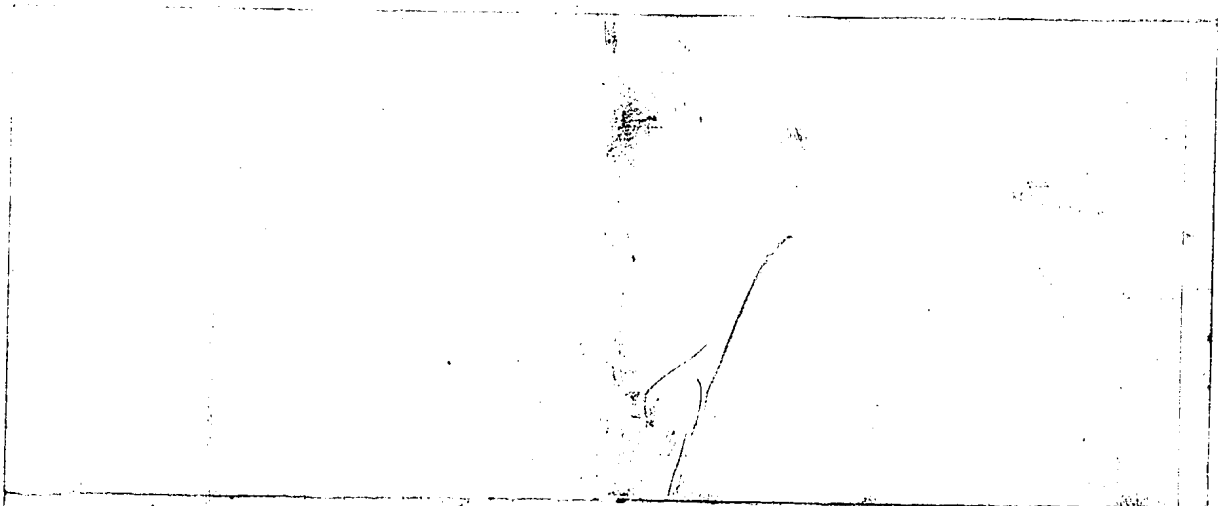
"

The real object of this letter is to lay before you, a new manufacture of porcelain lately discovered, and now in work here. I inclose you a short Circular describing its merits, and virtues. I have also instructed the Agent here to forward at once to your address, a small case of Samples of insulators for Telegraph wires made of this porcelain, as it is in this branch that we hope and expect particularly to do a very large business having received some very encouraging trial orders. It is thought that for this special purpose it will be highly successful, owing to its being perfectly non-absorbent, and therefore absolutely impervious to damp. I may add that every description of article now made in earthenware and porcelain can be made by this new process for exactly the same cost as common earthenware goods are now made.

I shall shortly send you a parcel of Samples tiles for flooring and making walls, &c &c. which I think will meet with the highest approval of yourself, and any one you may show them to, more especially if they are in the porcelain and earthenware trade. I doubt not that the insulators sent you: are the wrong pattern for your market, as they are made to the pattern used by our Govt. but this is of no consequence as they can be made with equal ease to any pattern, or size. so if you will get a pattern of those used on your side we can supply you with any quantity you may get orders for. In order to prove how very non-absorbent this manufacture is, I would ask you, to break one of the samples and on the partined piece, put a large quantity of ink let it remain as many hours or days as you please and then with a damp cloth, wipe the ink away; and you will

have no trace remaining, with the ordinary earthenware this is not the case, as if the same test is applied you will find that the material being spongy the ink will be absorbed as in blotting paper and impossible to remove."

"I will write you fully as to the terms we can offer and prices we can quote, in the meantime if questions are asked you as to price you can say, that the price corresponds with the prices now paid for the ordinary earthenware manufactures of this Country"



# THE EDISON ELECTRIC LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

Menlo Park, N. J., ..... 188

~~The invention consists~~

The object of this invention is to increase the economy of lighting by ~~incandescence~~ electrical incandescence,

The invention consists of the employment of chlorine to remove the hydrogen which is ever present in lamps consisting of carbon filaments, to ~~a certain~~ diminish electrical carrying which lessens the life of the filaments, and also to diminish the loss of heat due to the action of Hydrogen ~~upon~~ by causing the same to Enter into combination ~~to form~~ with the Chlorine to form Hydrochloric acid gas ~~which Enters into combination with~~ & thereby ~~Copper & forms Cupric~~ the residual gas being Chlorine + Hydrochloric gas does not carry heat from the Carbon to any extent thus saving loss ~~of~~ electrical energy & is to be used to give a certain [illegible]
and the Electrical [illegible]

is also greatly diminished Hence
the Life of the Carbon filament is
greatly prolonged
Obviously after the lamp bulb
containing the Carbon filament is exhausted
so that there is a high vacuum (dry)
Chlorine gas is admitted until the vacuum is
when the Vacuum is again raised moderately high
the filament is brought to incandescence
Heat Continued until nearly all of
the Chlorine is removed & high Vacuum
is attained. the lamp is sealed off &
is ready for use,
~~Which~~ ~~when~~ ~~come~~ ~~out~~ ~~of~~ ~~the~~ ~~filament~~
~~when~~ ~~the~~ ~~impurities~~ ~~are~~ ~~the~~ ~~pump~~ ~~or~~
~~which~~ ~~any~~ ~~of~~ ~~Carbon~~
~~for~~ ~~to~~ ~~the~~ ~~chamber~~ ~~wall~~.
~~Hence~~ another Convenient method
is to have an auxiliary tube leading
from the bulb containing a chloride
such as the Chloride of Antimony, Carbon

# THE EDISON ELECTRIC LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

Menlo Park, N. J., ..... 188

and other suitable ~~metal~~ Chlorides which can be volatilized by heat. When the Coke & fine Charcoal has been exhausted ~~the~~ & the air so far as possible removed from the Carbon by heating it with the Current & the auxiliary lamp to be heated by a lamp either to decompose the Chloride & Cause it to give out free Chlorine or drive the Volatilized Chloride into the Coke chamber Coming in Contact with the incandescent Carbon frees it of Hydrogen & leaves a metal & the two gases mentioned if a Metallic Chloride is used or deposits Carbon on the on the filament if a chloride of Carbon be used ~~or the Chloride of Hydrocarbon~~ Bromine or other heavy gas may be used that will Combine with the Hydrogen

Claim

In an Electric lamp giving light by incandescence the use of Chlorine to remove the Hydrogen.

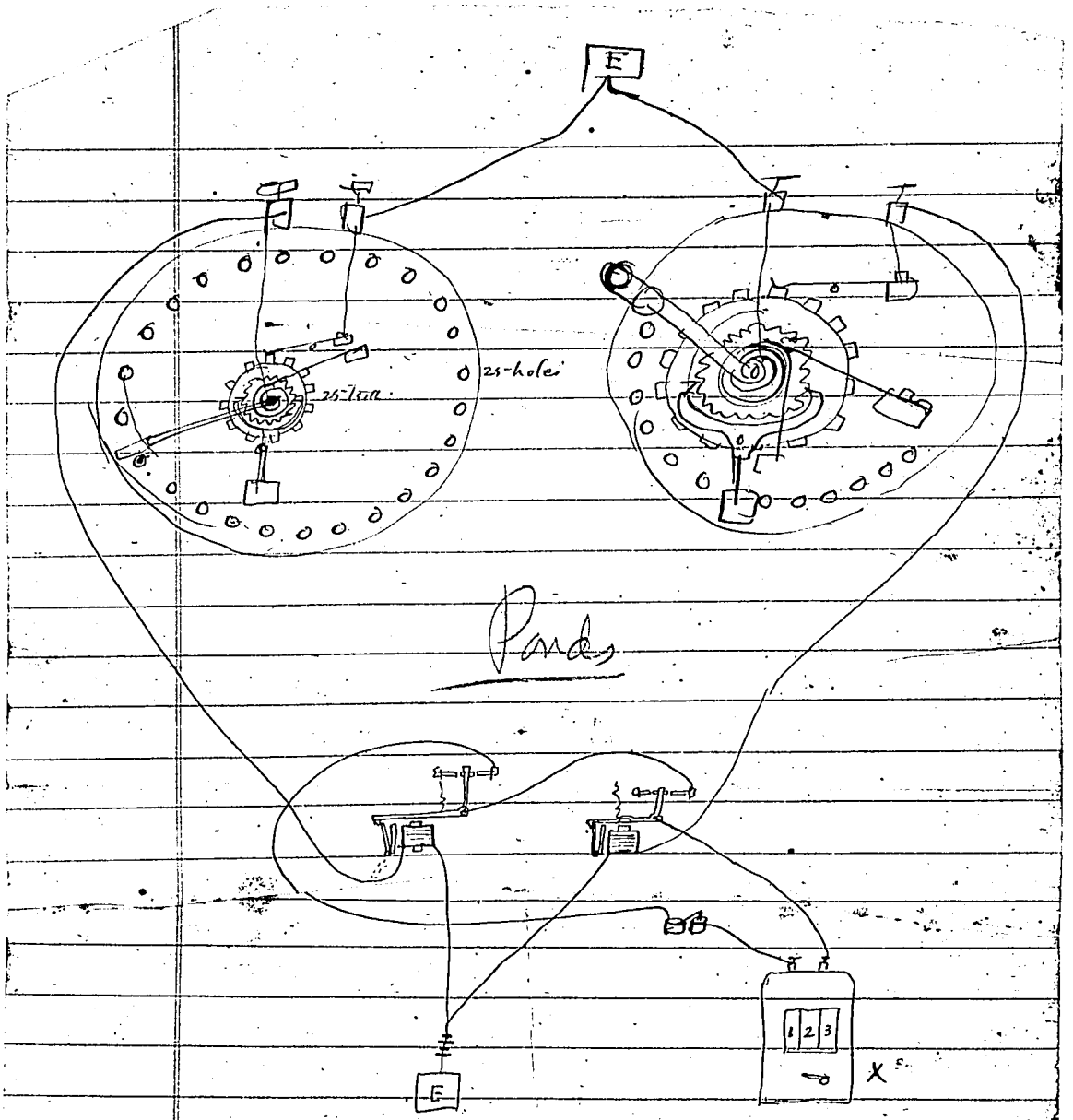
In an Electric Lamp giving light by incandescence the use of Chlorine to form the residual gas.

In an Electric Lamp giving light by incandescence the use of a Chloride of an element which Lamp while in the act of being formed or afterwards.

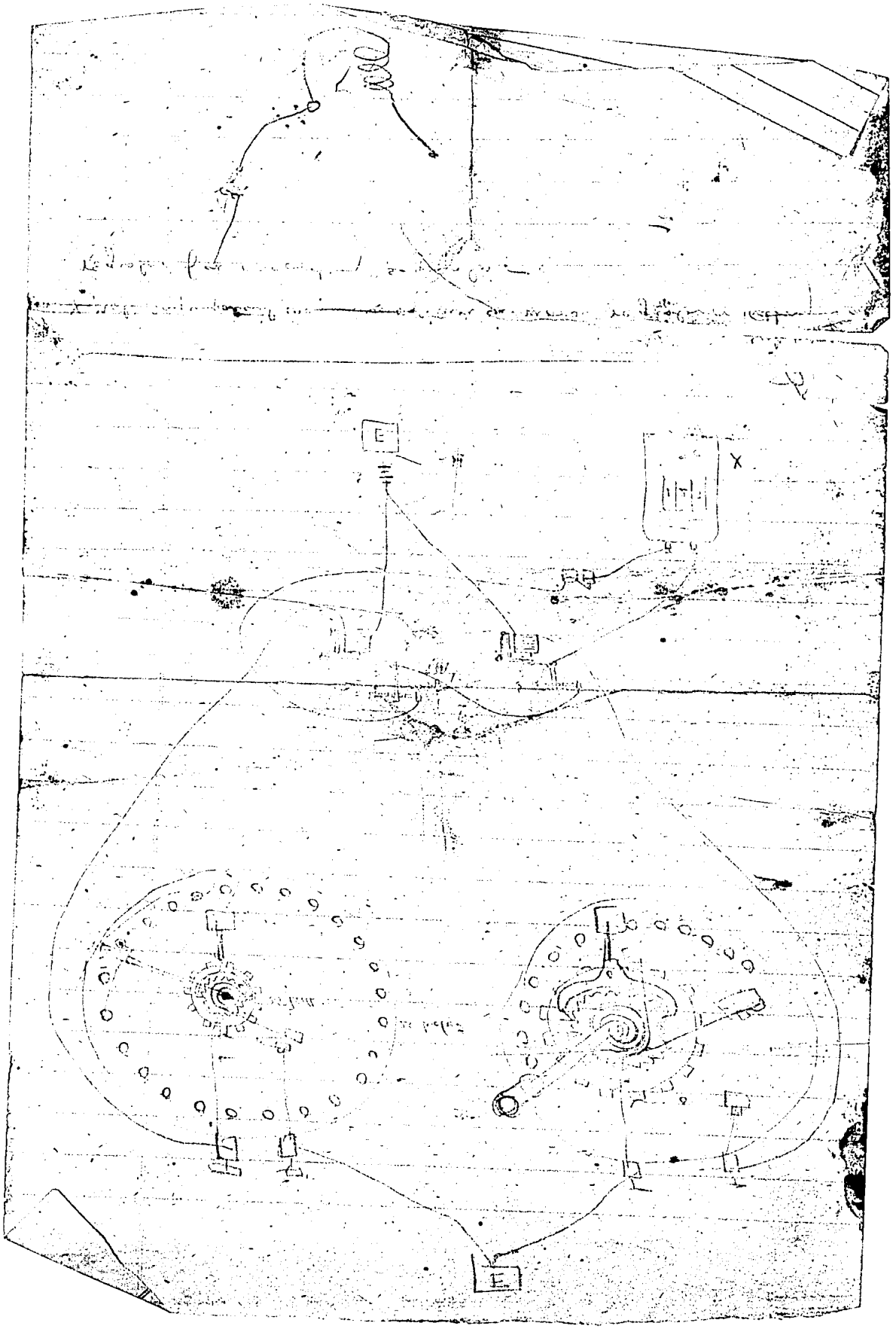
The use of Bromine Chlorine or any heavy gas that will combine with Hydrogen.

The use of a metal within the lamp which will combine with Chlorine so as to increase it to increase the degree of

The use of a Chloride of Carbon




What sequential we can substitute more regular or
regular for recording signals —

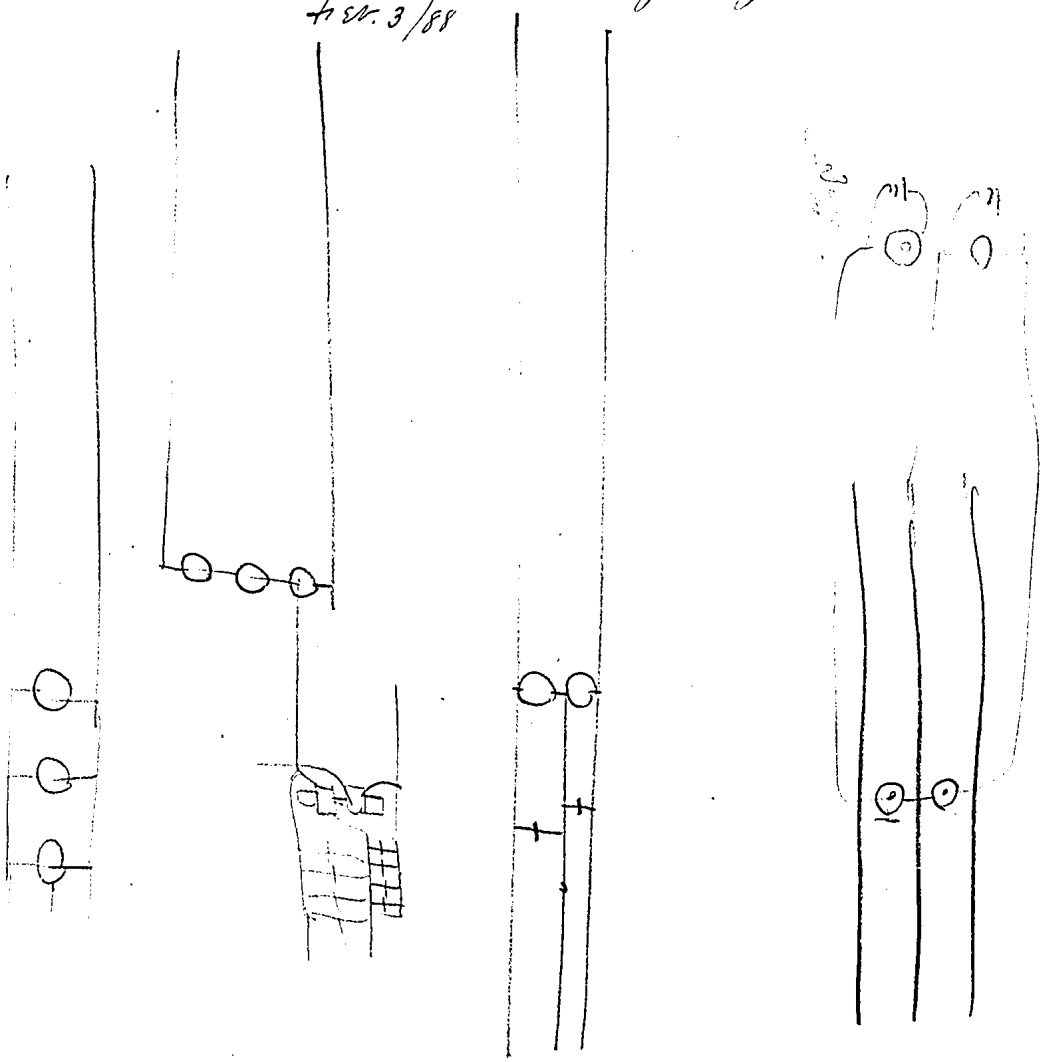

E
X
E

Cable Address "Edison, New York."

# From the Laboratory of Thomas A. Edison.

Menlo Pk. Edison Orange, N.J. _____ 188

Fr ex. 3/88



25000,

1500

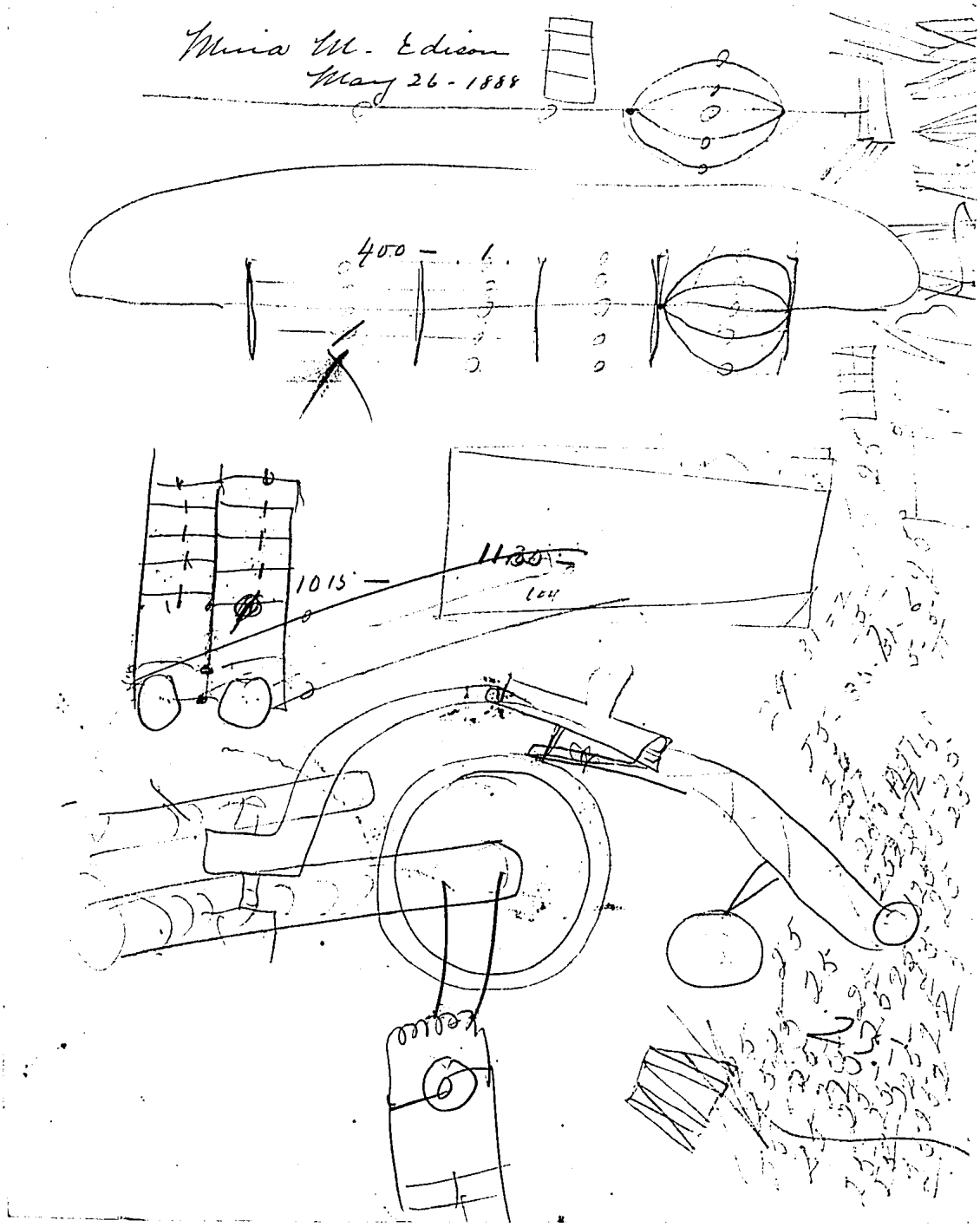
3

25

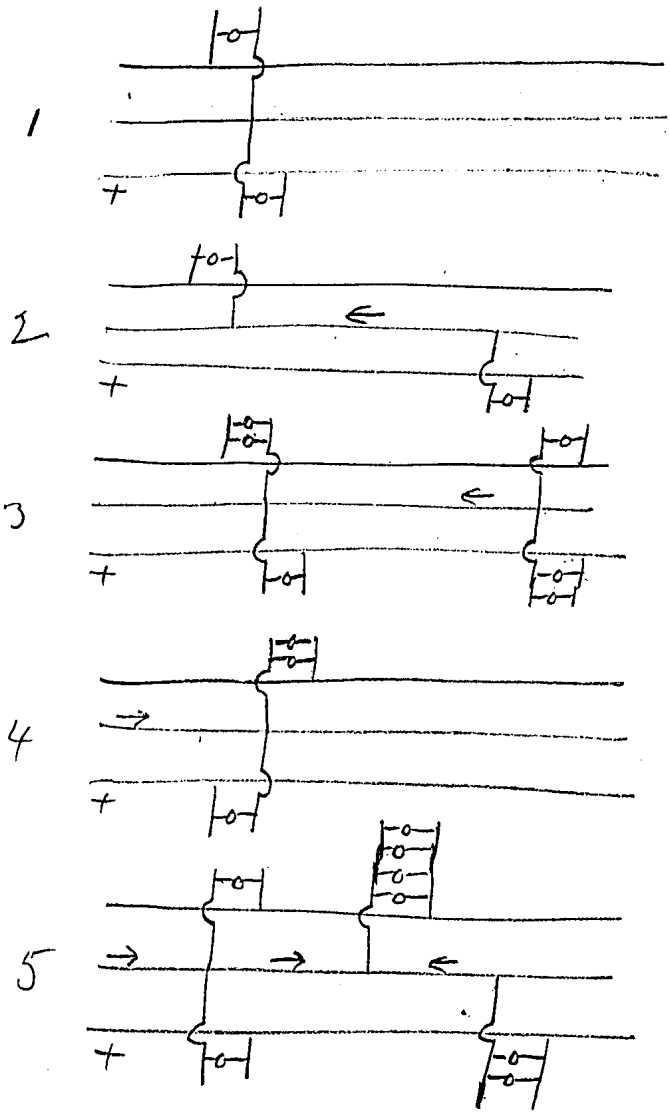
15000

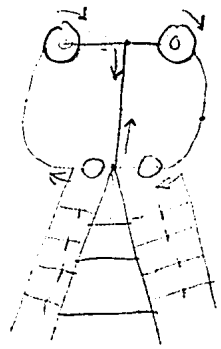
200
300
15
6000
90000

25000
3
75000


Thomas A. Edison
May 26 - 1888
400
1015
1100

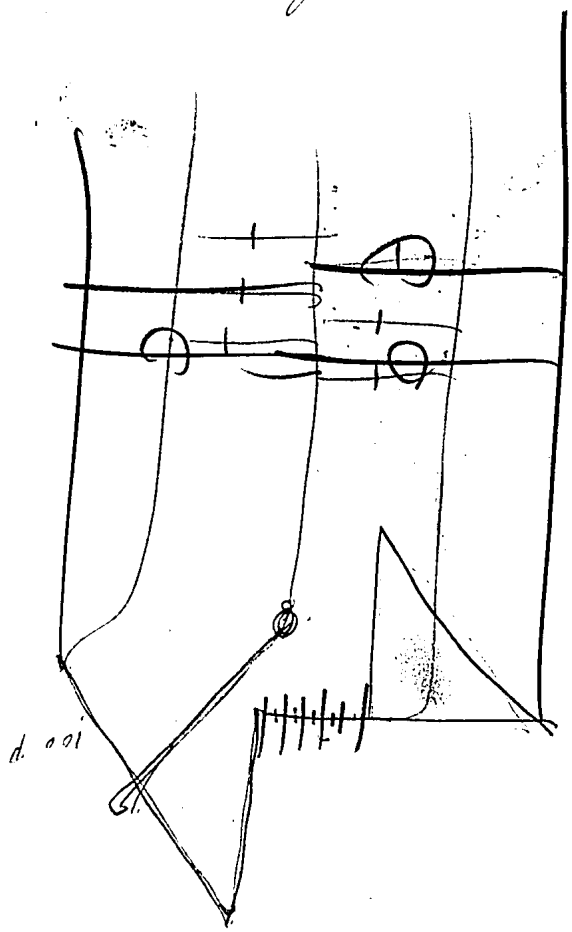
Thomas A. Edison
May 26 - 1888



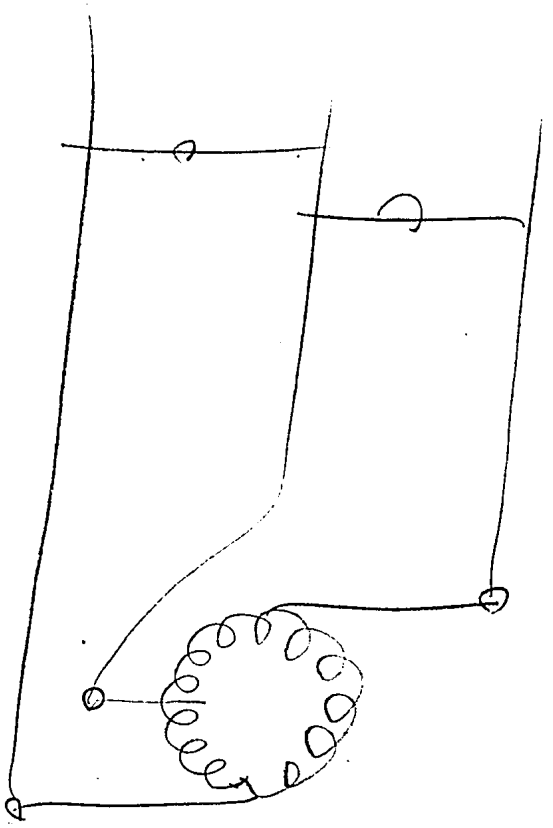



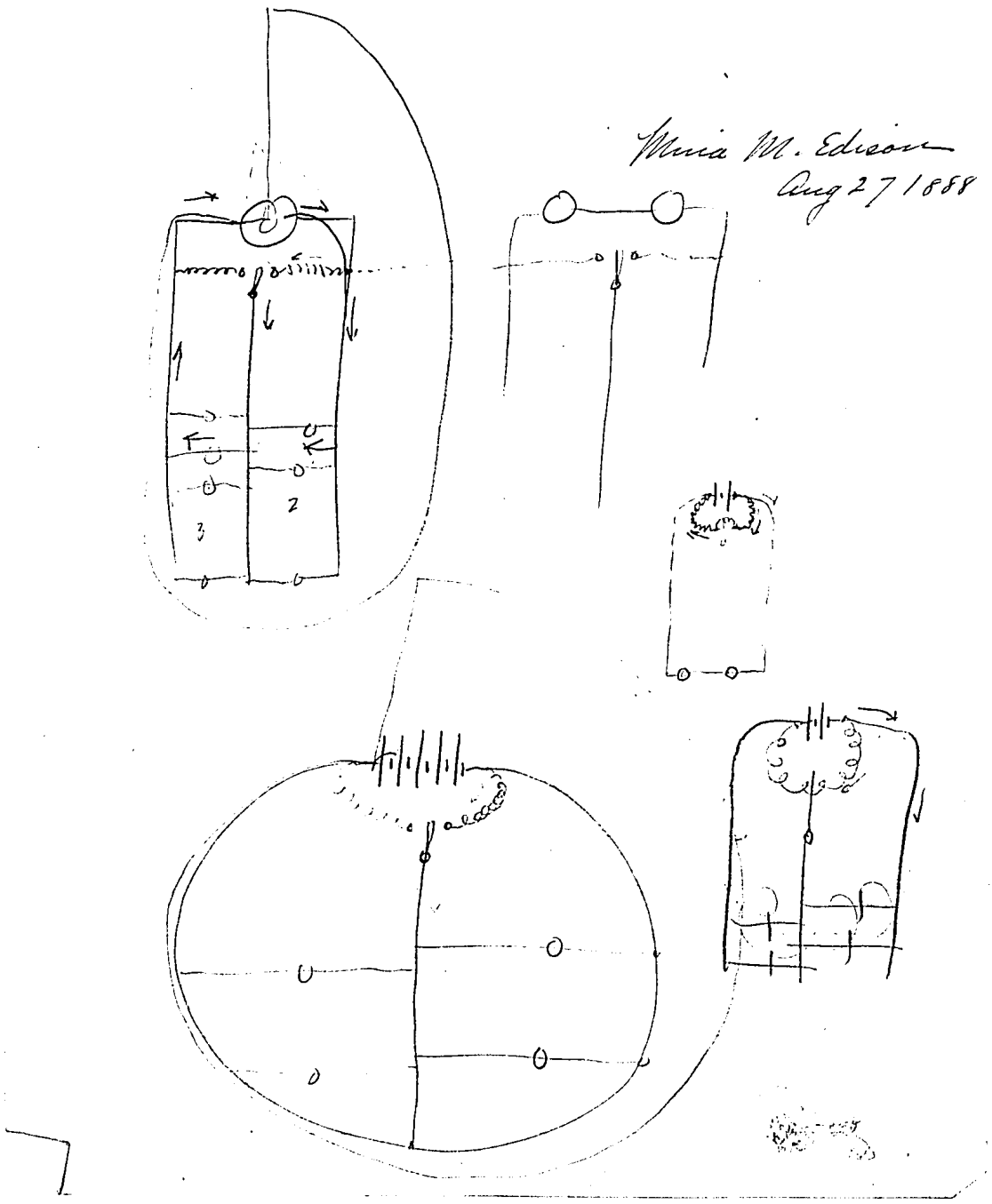
Thomas A. Edison

May 26-1888

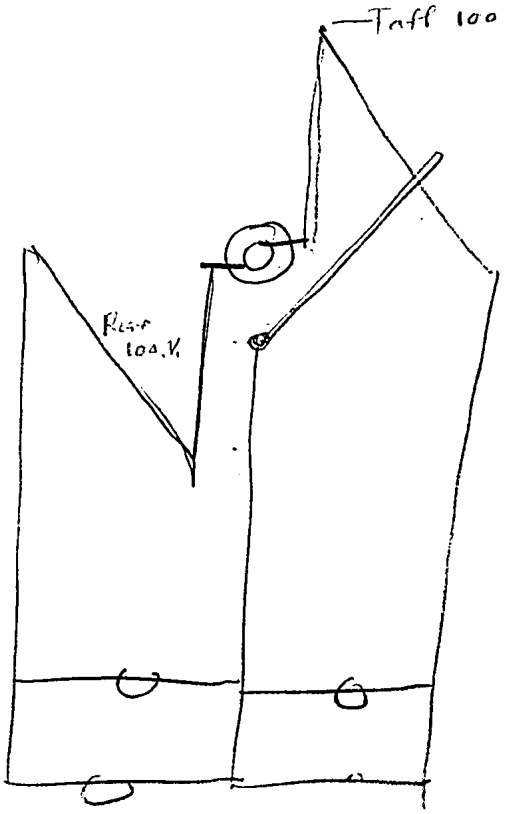


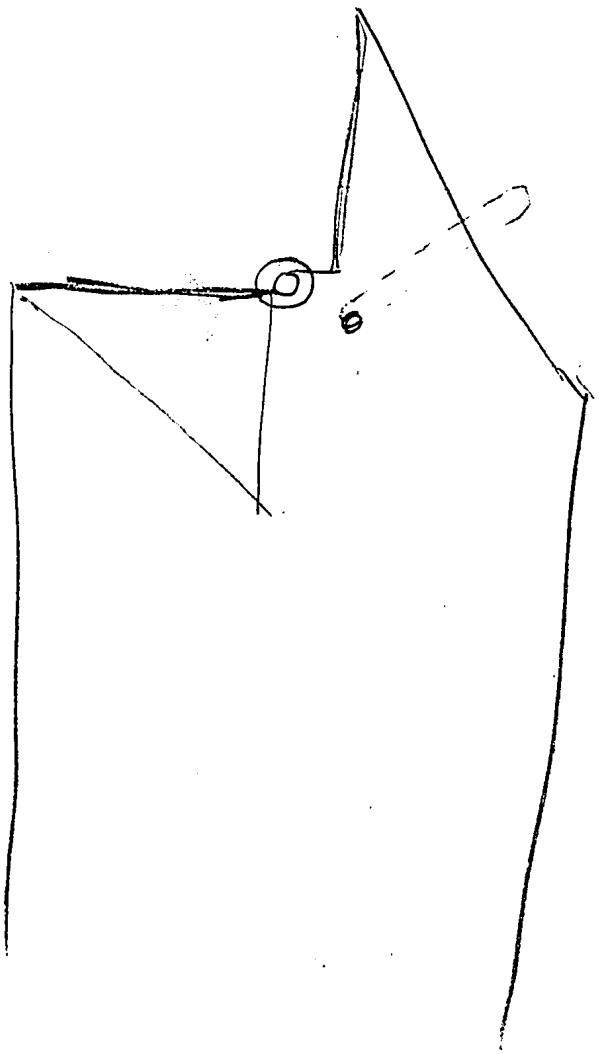
Thos A. Edison
May 26 - 1888



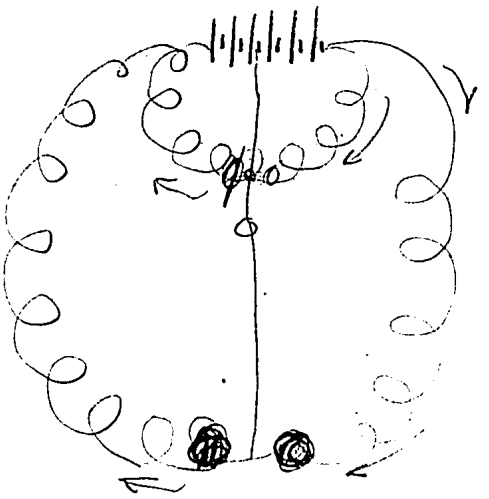

Maria M. Edison
Aug 27 1888
1
2
3

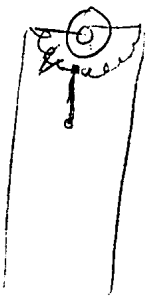
Illustrated London News
Aug 27 - 1888

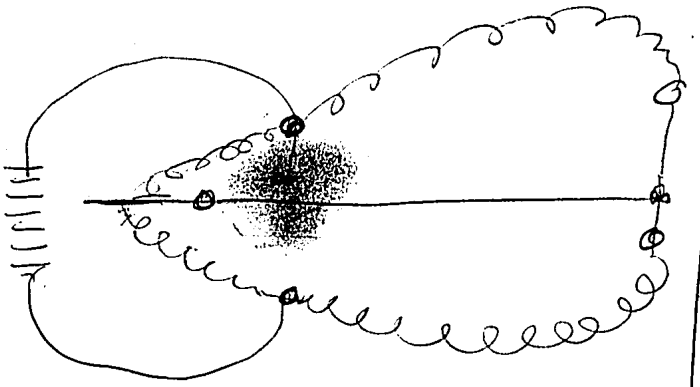


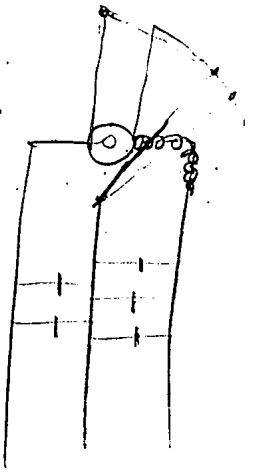


Thomas A. Edison
Aug 27 1888

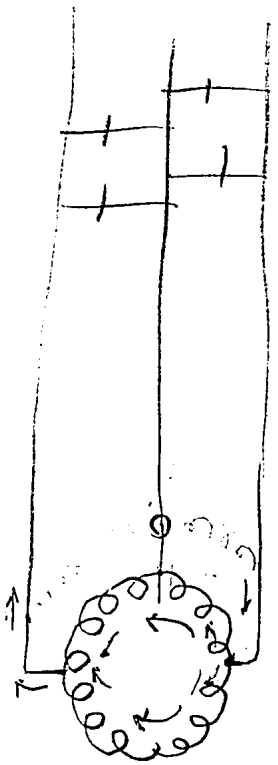


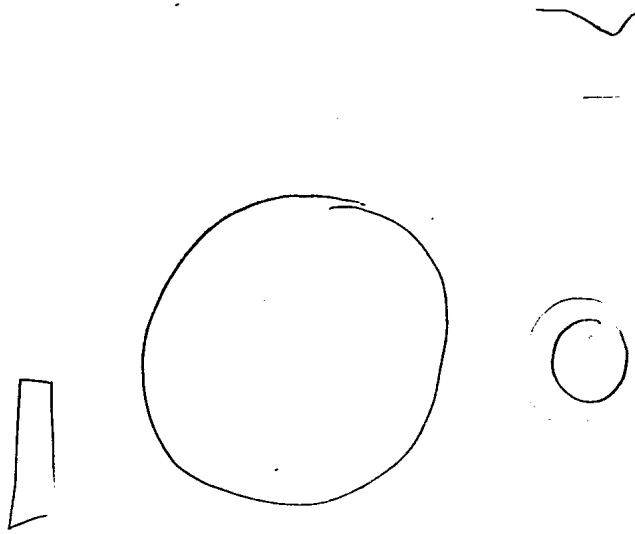






Mina M. Edison
Aug 27, 1888





Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Orange, N.J.

Subject,

2 wire #3 ½
3 " 1 ½
5 " #5

} same distance
same % loss

| wires | Size | No of wires | ?? | |
|---|---|---|---|---|
| 2 | 1 | #3 | 2 | 600 |
| 3 | 1/4 | | 3/4 | 37½ |
| 5 | 1/16 | | 5/16 | 15 ± |
| 6 | 1/25 | | 6/25 | 1/2 10 |

| | | | | |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |

5

Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Subject, _____

Orange, N.J.

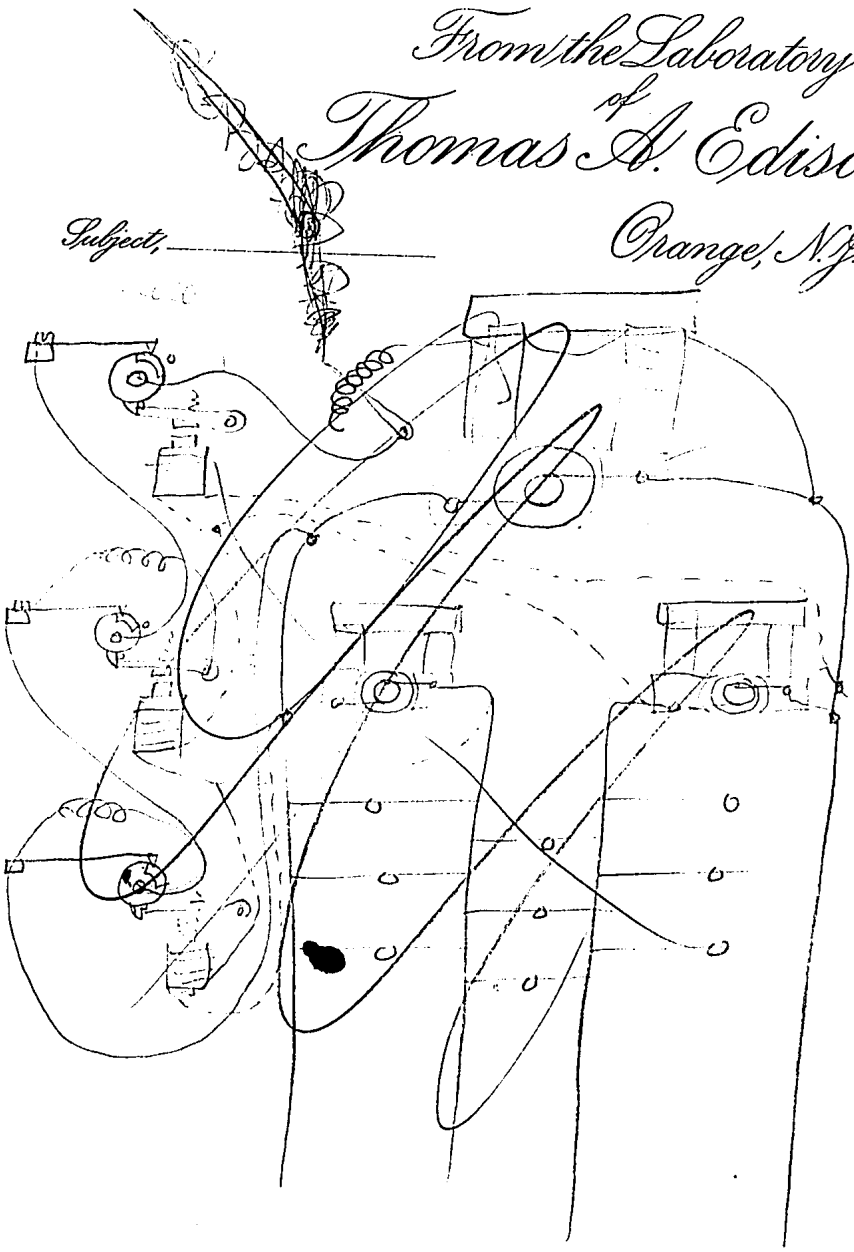
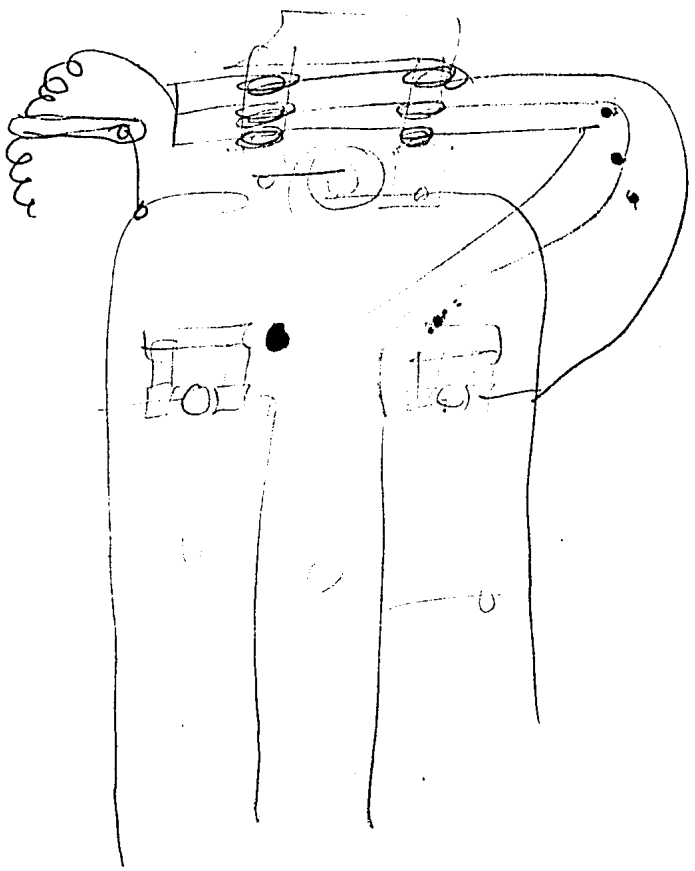


Fig 4

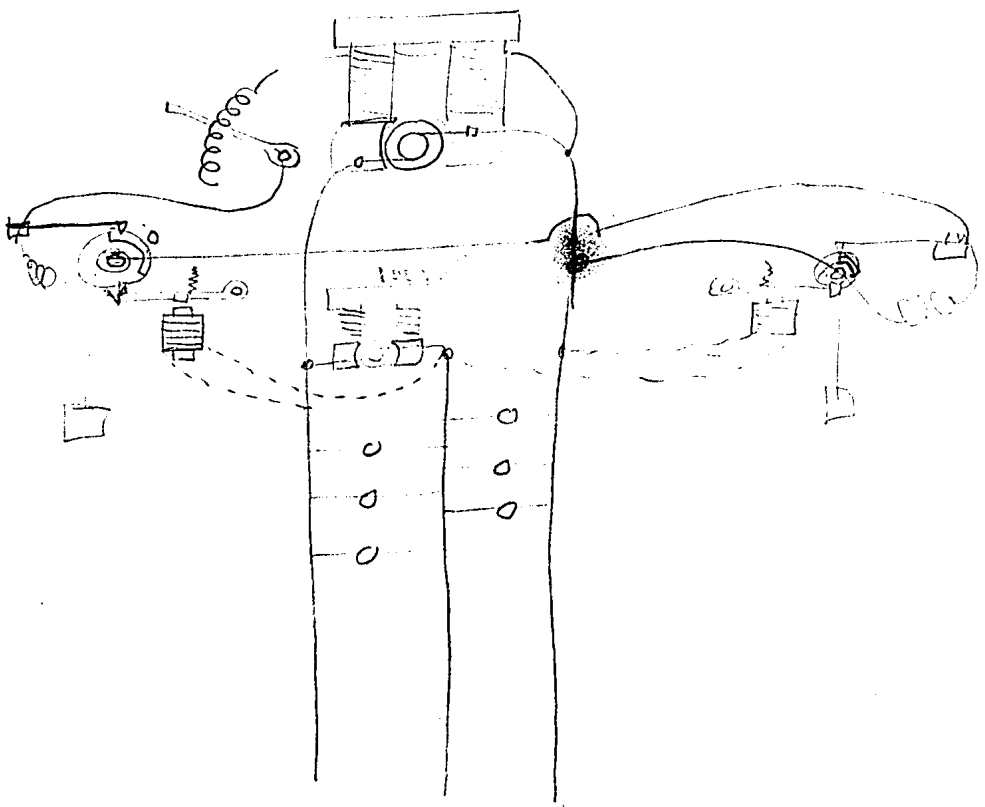


Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Subject, _____ Orange, N.J.

Fig 1

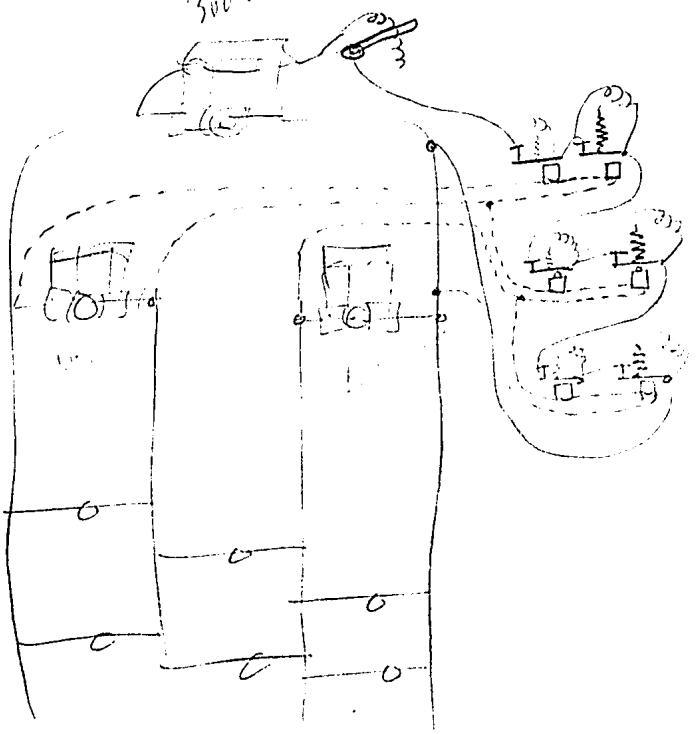


Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Subject, _____ Orange, N.J.

fig 2

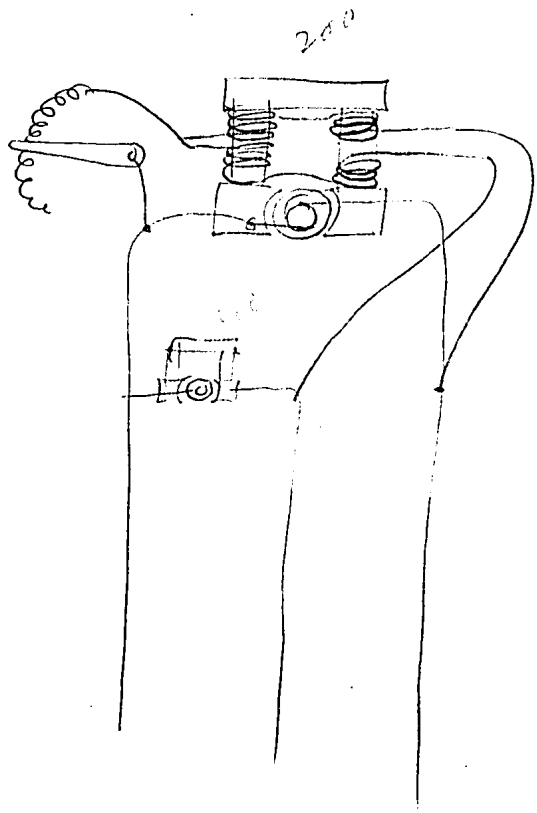


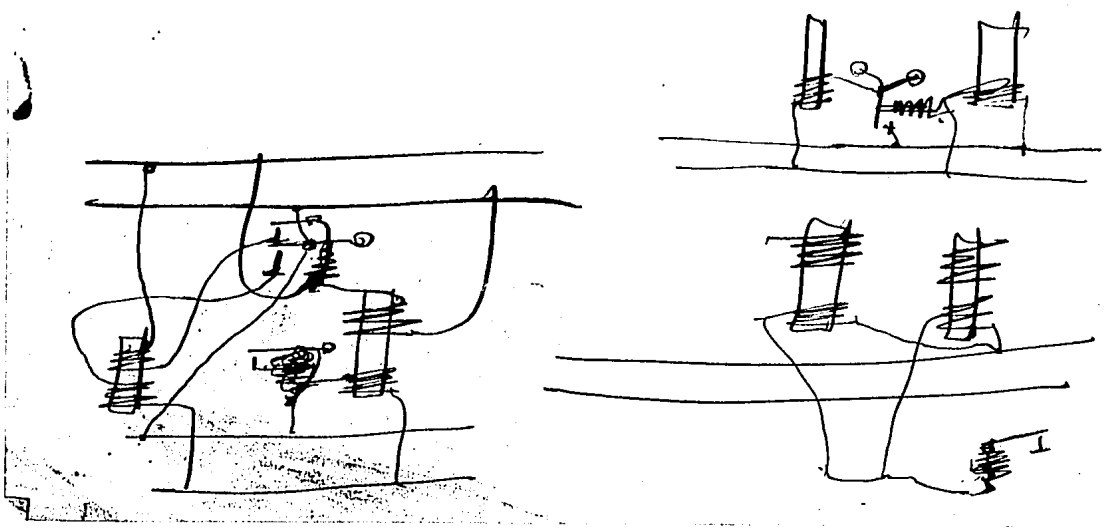
Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Subject, _____ Orange, N.J.

Fig 3



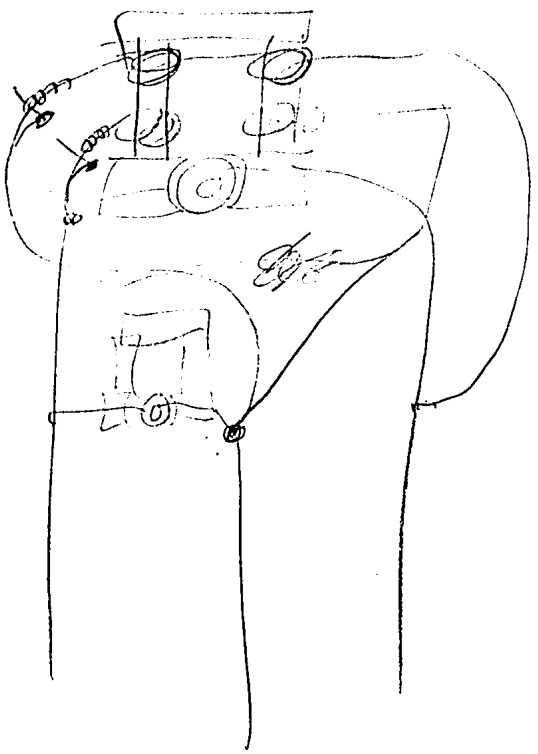


Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Subject, _____ Orange, N.J.

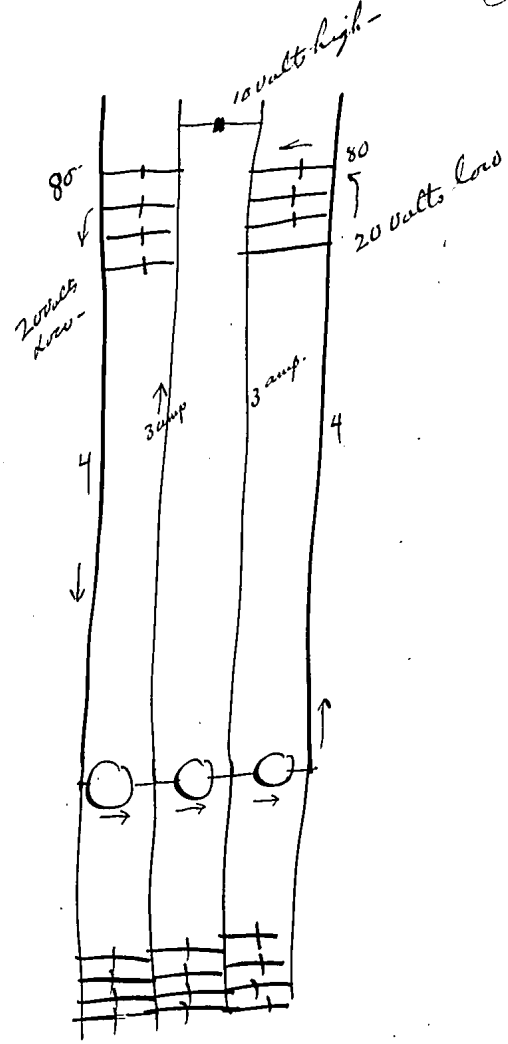
200 Volts.



Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

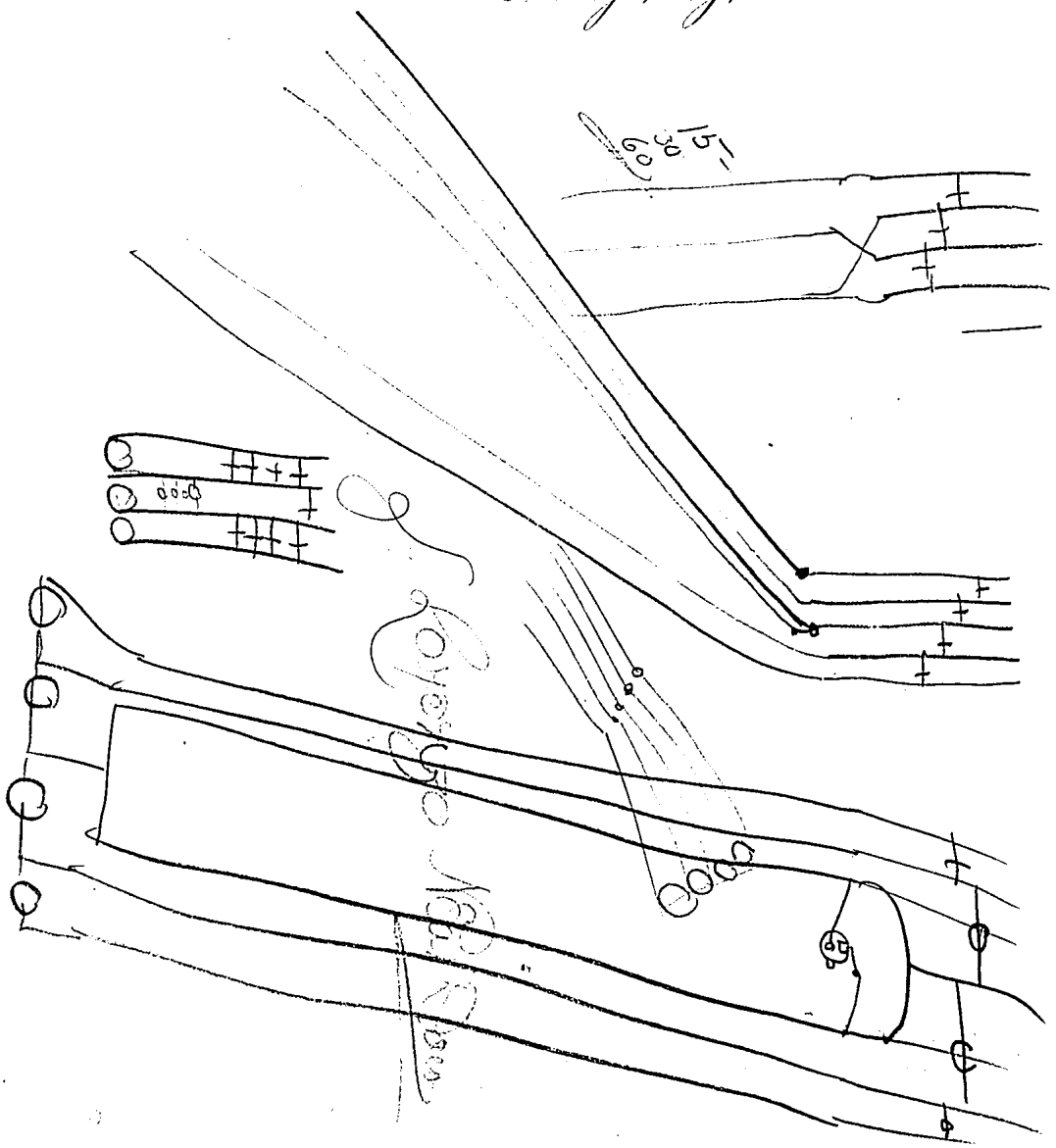
Orange, N.J. _____ 188

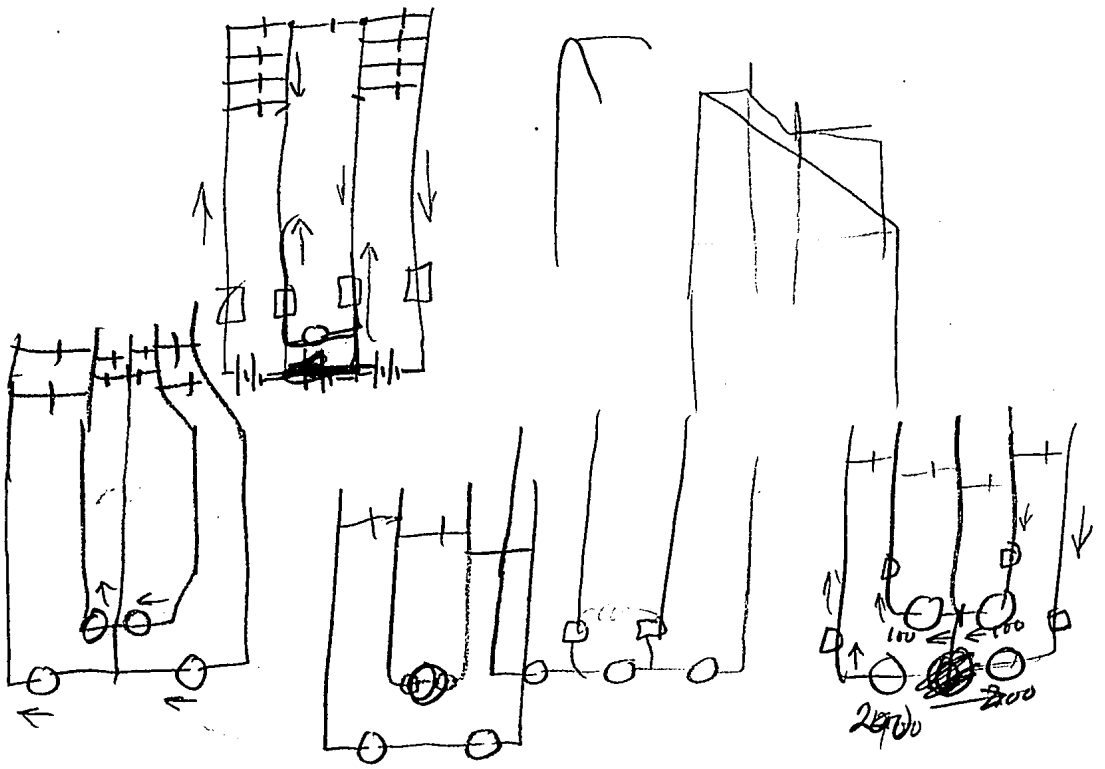


Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Orange, N.J. _____ 188

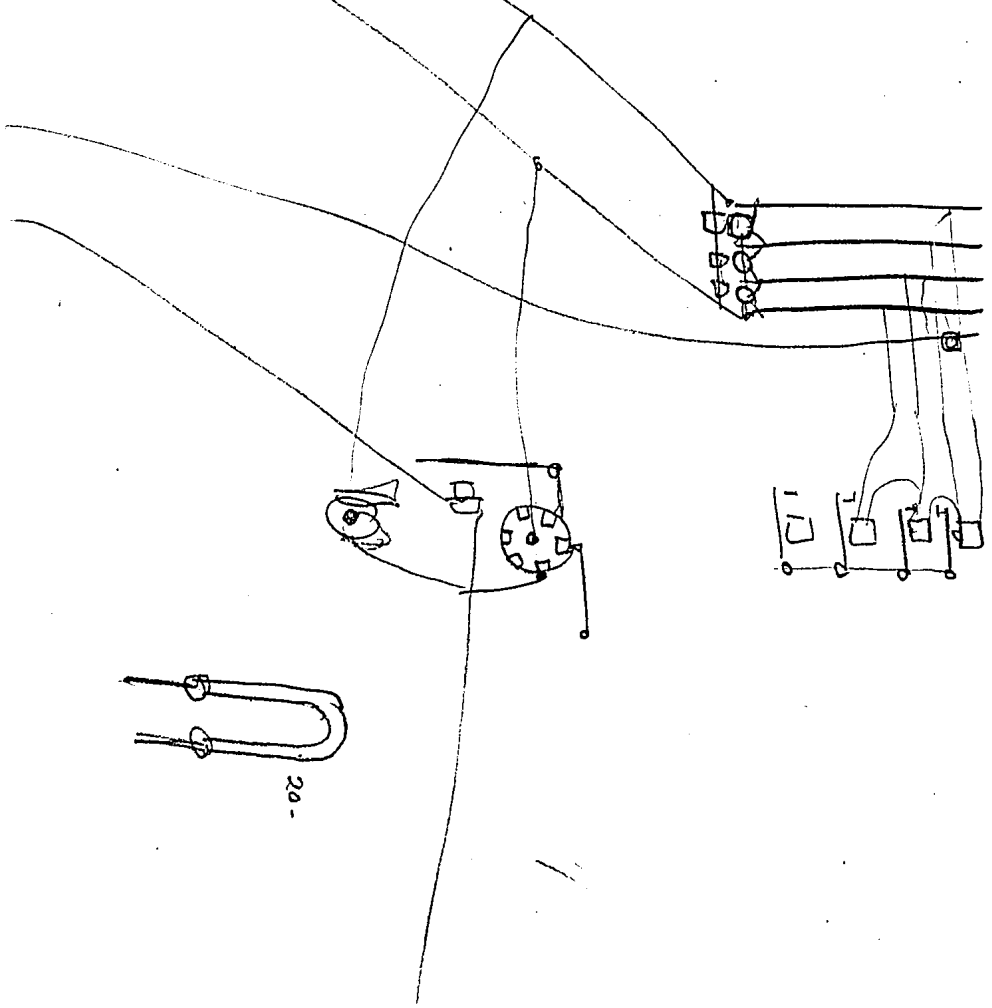



110
110
200

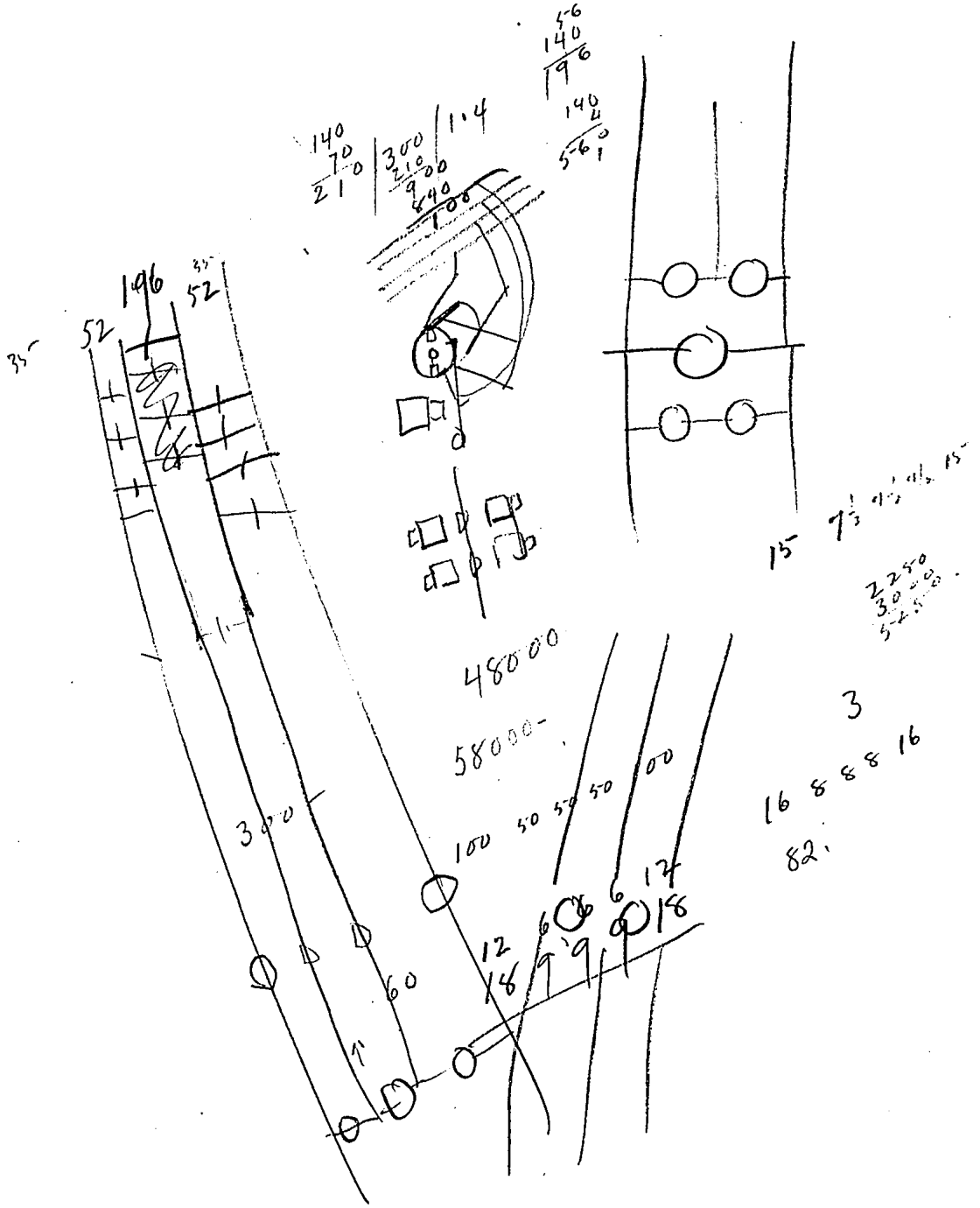
Cable Address "Edison, New York."

From the Laboratory
of
Thomas A. Edison.

Orange, N.J., _____ 188



20-

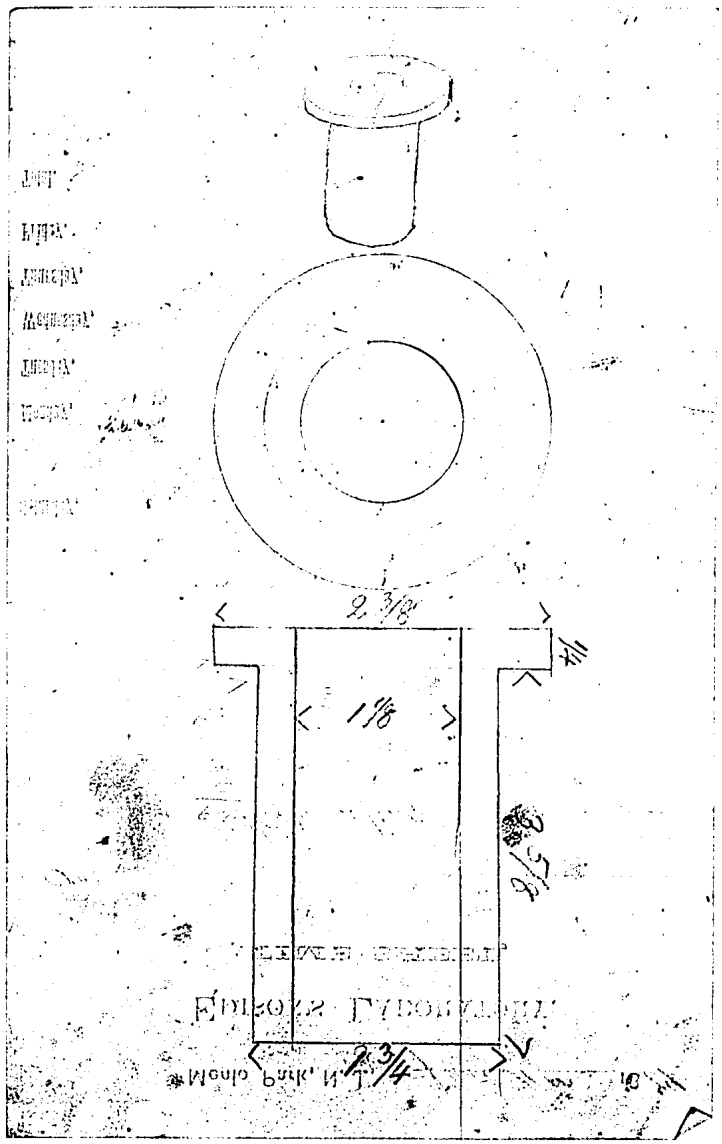

196
52
52
35
140
70
210
300
210
900
840
1400
1.4
140
140
56
196
56
140
560
15
480000
58000
3000
60
12
18
6
6
12
18
3
16 8 8 8 16
82.

## UNBOUND NOTES AND DRAWINGS, 1879-1886

The Unbound Notes and Drawings are miscellaneous loose pieces of paper containing technical notes and drawings made between 1879 and 1886. Most of documents are by Edison. There is also material by Charles Batchelor, John F. Ott, and other laboratory assistants. The documents relate primarily to electric lighting. Other topics include telephony, telegraphy, and electric railways. The notes and drawings appear on the microfilm in chronological order.

UNBOUND NOTES AND DRAWINGS

1879


2 3/8
1 1/8
2 3/4

Menlo Park, N. J., Jan 4th 1879

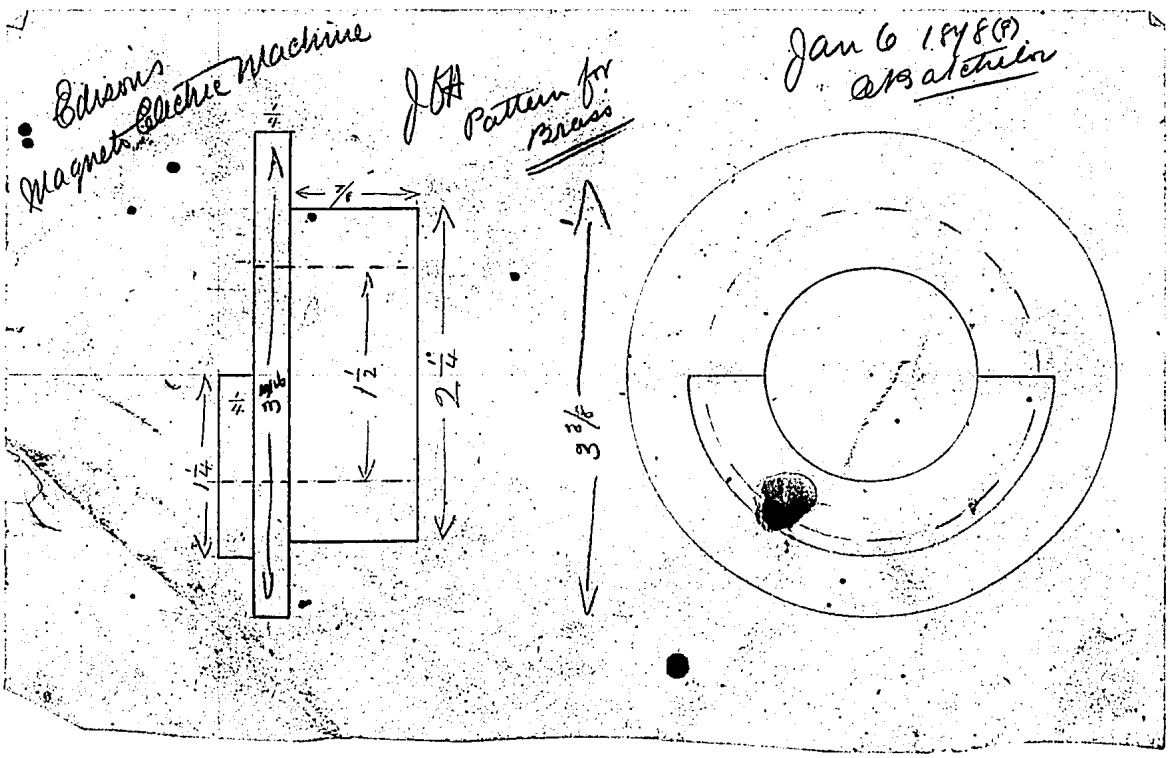
EDISON'S LABORATORY,

TIME SHEET,

For

Week ending

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Saturday, | | | | | | | | | | | | |
| Monday, | | | | | | | | | | | | |
| Tuesday, | | | | | | | | | | | | |
| Wednesday, | | | | | | | | | | | | |
| Thursday, | | | | | | | | | | | | |
| Friday, | | | | | | | | | | | | |
| Total. | | | | | | | | | | | | |


Edisons magneto Electric machine
J.H.
Pattern for brass
Jan 6 1879 (P)
as a retain
1/4
7/8
1 1/2
2 1/4
1/4
3/16
1/4
3 5/8

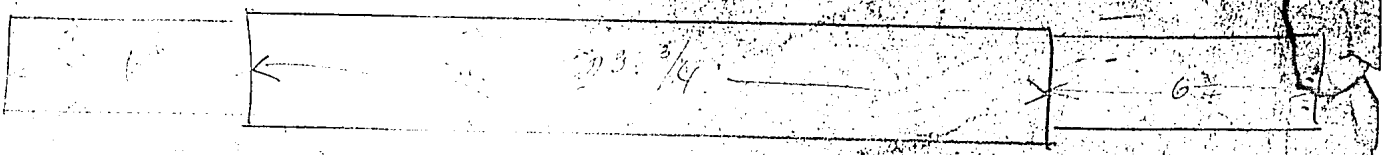
Edisons Magneto-Electric Machine

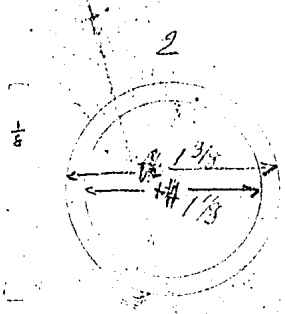
Jan 6 1879

Chargatches

Mr Jackson

1 Shaft 1½" diam. in middle
and one end ¼ in 6¾ in long
and the other ¼ in 6 in long

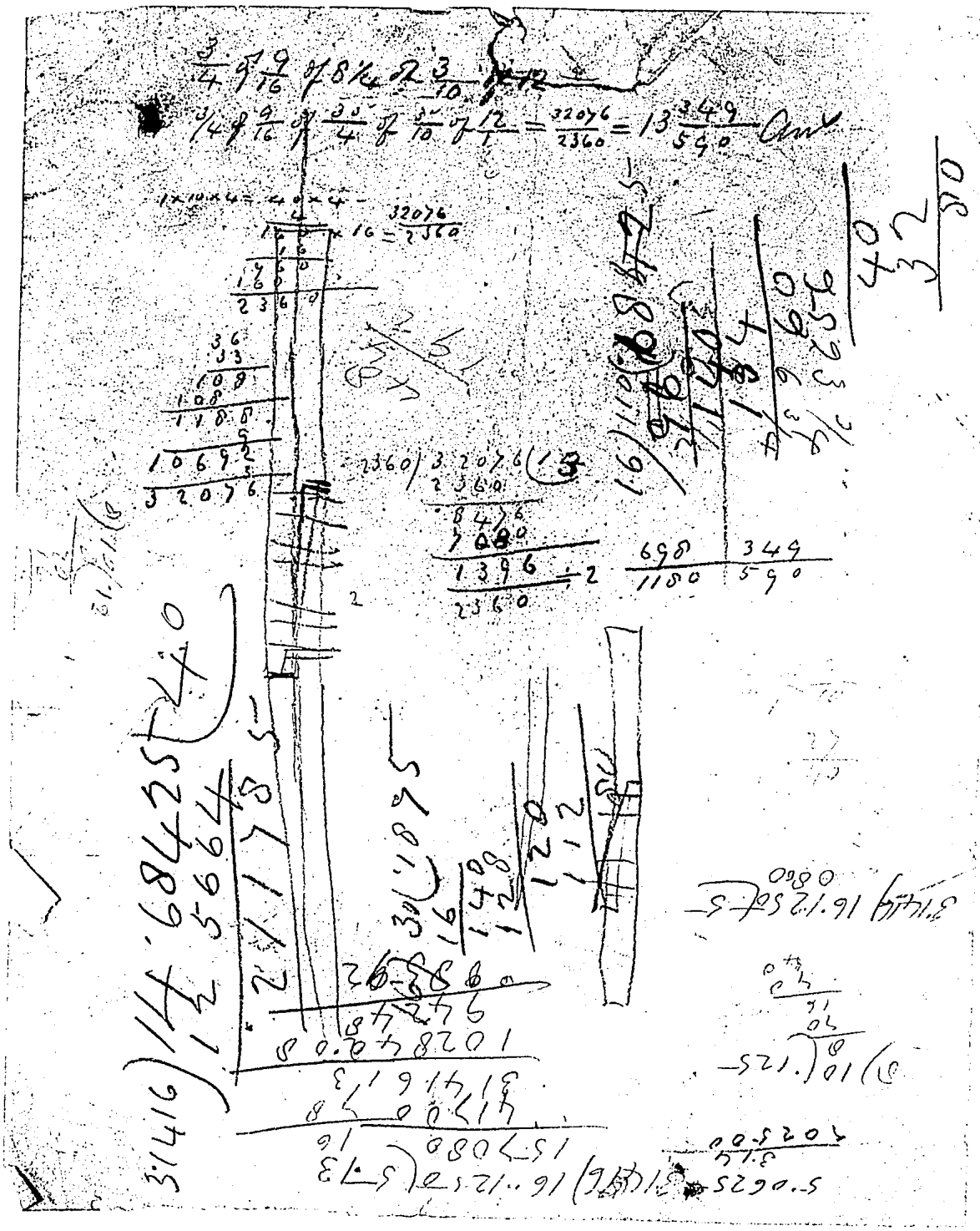



Also

2 washers ½ mm loose on
small ends

Leave the middle a shade large
so that it can be filed to the
hole after Logan has bored it



Resistance cold with 1 Callaud cell 6.39 ohms — Iridium Platinum alloy 20 pc for Nickel Plating — Spool No. 1

Conduit & Hansen Battery — Fresh - Bradley gal. Strap shunted with thick wire = Bradley Rheostat Coil 4 Jan 14 1879

| Size of Wire | Length of Wire | No of Cells | Deflect$^n$ | Colors | ohms Resistance | Deflection$^2$ × Resistance | Ratio to $C^2 \times R$ when cold | Ratio $C^2 \times R$ when dull Red | | Remarks. Characteristics |
|---|---|---|---|---|---|---|---|---|---|---|
| .004 | 150 ~~1500~~ | 1 | 4° | nil | 6.39 | 39. | | | | |
| " | " | 2 | 6° | nil | 7.8 | 86. | 2.19 | | | |
| " | " | 3 | 8° | nil | 8.1 | 159. | 4.06 | | | |
| " | " | 4 | 10° | just beginning Kahno | 8.8 | 273. | 6.97 | | | |
| " | " | 5 | 11° | Red | 9.8 | 369. | 9.42 | 1.35 ~~2.04~~ | | |
| " | " | 6 | 12.30 | Bright red | 10.2 | 499. | 12.7 | 1.85 | 1.35 | |
| | | 7 | 13½ | Yellow Red Orange | 11.4 | 639. | 16.2 | 2.34 | 1.73 | Looks at distance of 2 feet ½ thick |
| | | 8 | 14½ | Yellow + almost ant. light | 11.4 | 740. | 18.9 | 2.71 | 2. | " " " " 1/16 thick |
| | | 9 | 15° | Quite White | 12.2 | 875. | 22.3 | 3.21 | 2.38 | Appear a shade over 1/16 thick |
| | | 10 | 16° | Bright light | 12.6 | 1030. | 26.5 | 3.79 | 2.8 | " " " " " " |
| | | 11 | 17½ | White light ink shade of Yellow. | 12.96 | 1280. | 32.7 | 4.68 | 3.48 | Seems covered with fine lines at edges like sea shading on map. |
| | | 12 | 18½ | full White | 13.26 | 1470 | 37.8 | 5.4 | 3.98 | |
| | | 13 | 19½ | Brilliant White | 13.56 | 1700 | 43.4 | 6.22 | 4.61 | |
| | | 14 | 19½ | Intense White | 13.86 | 1720 | 44. | 6.31 | 4.67 | Sufficiently brilliant for our purposes. |

Iridium Platinum Alloy 10 pc Spool No 2 —
Condit'n in large Cell Carbon — = Bradley Gals. No 2 shunted with short wire No 2
Resistance cold on 1 Calland Cell 6° ohms —

| Size of Wire | Length of Wire | No. of Cells | Deflec. | Color. | Resis. to others | Deflec.$^2$ X Resis. | Ratio to $C^2 \times R$ when Cold | Ratio to $C^2 \times R$ when Dull Red | Remarks. |
|---|---|---|---|---|---|---|---|---|---|
| | m.m. | | | | G.I. | | | | |
| .004 | 150 | 1 | 4° | | 6·7 | 30. | | | |
| " | " | 2 | 6¾° | | 6·7 | 93. | 3.1 | | |
| " | " | 3 | 9½ | | 7·3 | 204 | 8.6 | | ~~faintest glimmer of Red~~ |
| " | " | 4 | 11° | faintest glimmer of Red | 7·9 | 297 | 9.7 | | Jan. 14 1879 |
| " | " | 5 | 13° | Dull Red | 8·5 | 452. | 15.1 | 1.53 | Clark Rochester |
| " | " | 6 | 14° | Orange Red | 8·73 | 541 | 18.1 | 1.82 1.19 | |
| " | " | 7 | 15° | Orange Yellow | 9·2 | 660. | 22.2 | 2.23 1.64 | |
| " | " | 8 | 16° | Yellow | 9·6 | 788. | 26.3 | 2.64 1.74 | |
| " | " | 9 | 17½ | whitish Yellow | 10· | 991. | 33.1 | 3.31 2.21 | |
| " | " | 10 | 17½ | Yellowish White | 10·3 | 1020 | 34.1 | 3.43 2.26 | |
| " | " | 11 | 19 | White | 10·5 | 1240 | 41.4 | 4.17 2.74 | about same as Candle |
| " | " | 12 | 19½ | full White | 10·7 | 1340 | 44.5 | 4.53 2.97 | can just see the fringes |
| " | " | 13 | 20½ | Bright White | 11° | 1530 | 51.2 | 5.16 3.39 | fringes very prominent |
| " | " | 14 | 21 | Brilliant White | 11·5 | 1690 | 56.5 | 5.69 3.75 | |
| | | | | | | Permanent elongation of Wire | | | 1 m m |

Length of Wire reduced to 140 m.m. at. g. globulated

No 3

Jan 14 1899

Chas Batchelor

# Platinum wire.

Spool No 3

When Cold on Callaud Cell 3.6 ohms

Battery Carbon C+H large ...

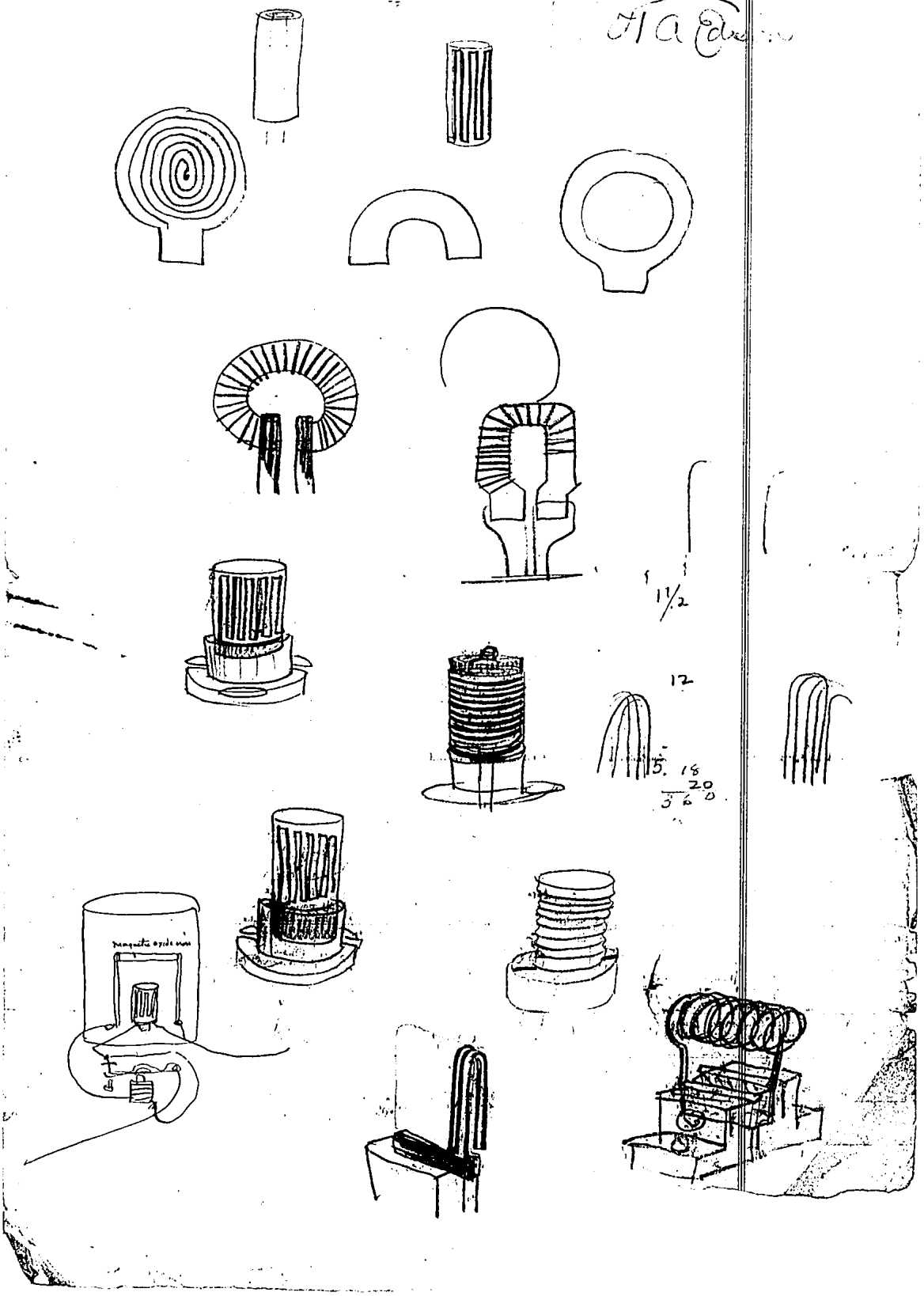
Galv. Bradley No 4 shunted with large wire.

| Size | length of wire | Cells | Deflec° | Color | Resistance Ohms | Deflec² x R | Ratio k C² x R cold | Ratio k C² x R Dull Red | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| .004 | 150 m m | 1 | 5.° | | 4 [illegible] | 30.6 | | | |
| " | " | 2 | 8½ | | 4.9 | 120. | 3.56 | | |
| " | " | 3 | 11 | | 5.7 | 215 | 7.03 | | |
| " | " | 4 | 13 | Dull Red | 6.3 | 346 | 11.3 | | Better than first color on No 1 + 2 Sheets |
| " | " | 5 | 14 | Red | 7.2 | 447 | 14.6 | 1.29 | |
| " | " | 6 | 15½ | Yellowish Orange | 7.9 | 607 | 19.8 | 1.65 1.35 | Special Remark — Platinum wire .004 300 m m wound in Spiral ¼ diam 2 Cells bring it = dull red Resist. cold 6.1 ohms |
| " | " | 7 | 16½ | Yellow | 8.3 | 638 | 20.8 | 1.84 1.42 | |
| " | " | 8 | 17½ | Light bright Yellow | 8.74 | 869 | 28.3 | 2.51 1.94 | |
| " | " | 9 | 18½ | Whitish Yellow | 9. | 1.150 | 33.1 | 2.92 2.26 | |
| " | " | 10 | 19½ | Yellowish White | 9.2 | 1.150 | 37.7 | 3.33 2.58 | |
| " | " | 11 | 20½ | White | 9.5 | 1.328 | 43.4 | 3.83 2.97 | |
| " | " | 12 | 21 | Bright White | 9.9 | 1.452 | 47.6 | 4.22 3.26 | This |
| | | 13 | 21½ | Brilliant White | 10.5 | 1.663 | 54.4 | 4.81 3.72 | |
| | | 14 | | very Brilliant white | | | | | Melted before we could test |

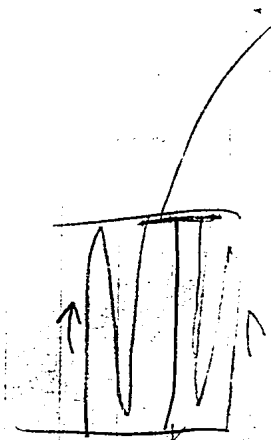
With 14 cells on 170 m.m. it melts: on 180 m.m. Deflec 21 Resist. 12 ohms

Scarcely any permanent elongation

January 28 1879

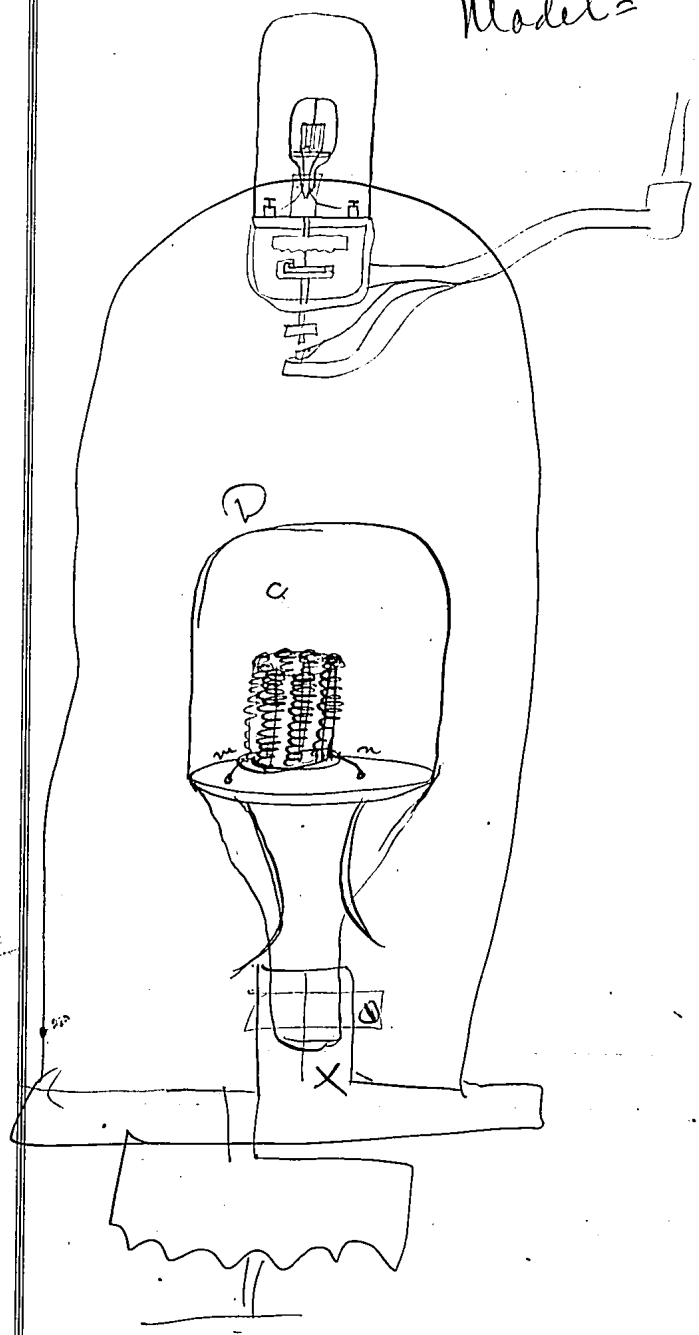


Jan 28 1879



John Ott

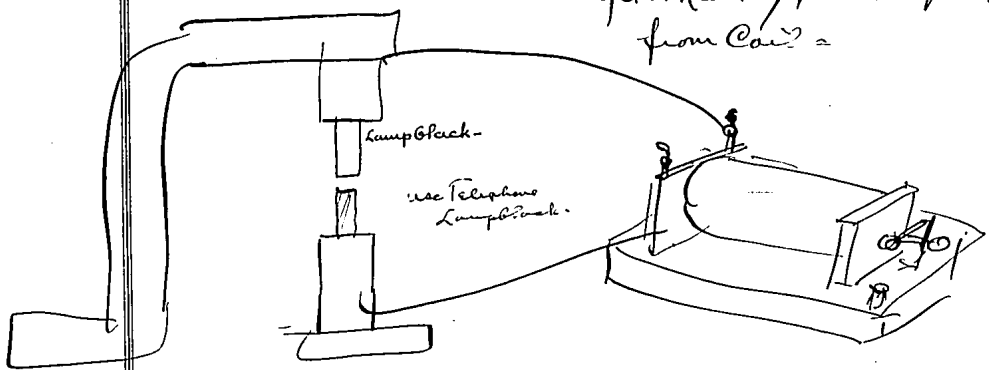
Model =



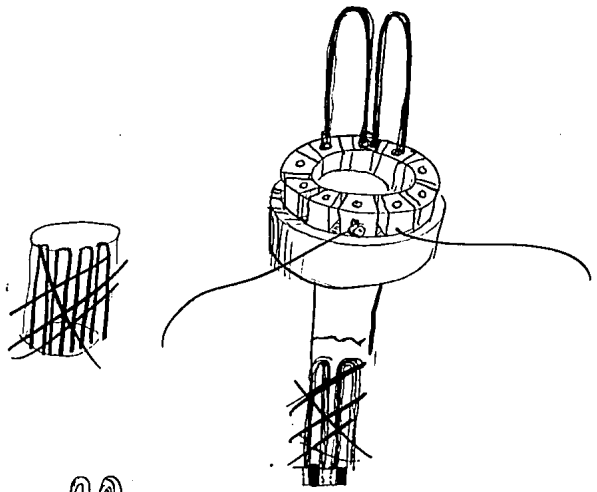

LW

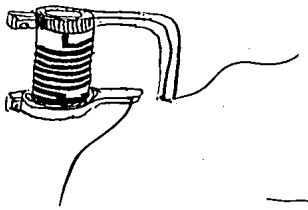
Experiments for Upton

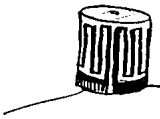
get at least 1/4 inch spark from Coil =



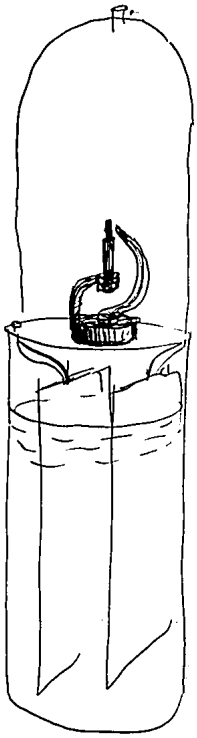

18
16
108
18
2(20)
2 : 20
420

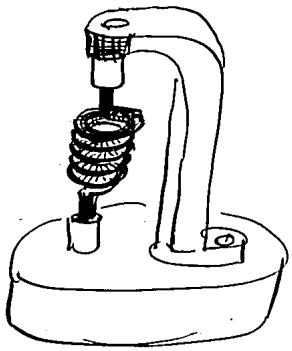







a
a'





Cover &

The object of this invention is to economically produce & subdivide the Electric light =

The invention consists in the use of an ~~oxidizable~~ incandescent conductor of very pure iron, nickel or cobalt in a vacuum

The invention further consists in the use of an incandescent conductor of platinum - Iridium Rhodium Osmium Palladium or alloys of either in a Vacuum within a second Vacuum or ~~closed~~ seal Globe at the atmospheric pressure, the heat of the first Vacuum tube due to the heating of the conductor Commencing with the use of the second Globe to Expand it for the purpose of giving motion to a current regulator as already shown in my patent ~~of~~ applied for ——————

——————— 1879 =

The invention further consists in the method of manipulating the incandescent Conductor before final sealing within the first Vacuum tube =

I have discovered ~~by observing the anomalous behavior of platinum at high temperatures~~ that chemically pure iron when drawn in wire and formed into a spiral, & then placed in a vacuum may be brought to ~~a bright~~ incandescence, I have also discovered that many metals which have gas within their pores have a lower melting point than when free from such gas - for instance Iron wire has, by drawing several volumes of Carbon Monoxide gas within its pores, If such wire be placed in a vacuum and the full current be put upon it it rises to a ~~brilliant~~ incandescence ~~If the~~ current is increased it reaches a brilliant incandescence & then melts but if after the vacuum has been made the wire is brought to a faint dull red for several minutes gas is occluded, then vaccum is then made again perfect & the metal ~~made bright~~ brought to a yellow heat by the current & allowed to remain so for several minutes. & the vacuum again made perfect: then by adding more & more battery manipulating the vaccum at each

increase of temperature the iron may be brought to the most dazzling incandescent which is perhaps 1000 degrees higher than its fusing point with the gases within its pores. Thus iron may be brought to a much higher incandescent than platinum or platinum-Iridium alloy in the open air.

The same effect takes place with platinum & other metals - With platinum in the open air if the current is placed on suddenly the gas within its pores expands explosively & disrupts the platinum so that it shows myriads of cracks when the sudden expansion of the gas has caused the metal to expand beyond a point where it naturally would were there no gas.

But in a Vacuum where reabsorption of the gases are prevented & by pulling on the current gradually & manipulating the vacuum as before mentioned a Platinum Iridium spiral having but 1/4 of an inch radiating surface may be made to give a light equal to 21 candles steadily for hours whereas in the open air it requires nearly 1 inch of radiating surface to produce the same effect because the melting point

of the platina alloy & gas with it is enormously lower than as described = Once the gas has been ~~acted~~ Excluded from the metal the current may be put on or off suddenly = of course porous ~~metals~~ Conductors such as carbon would be enormously benefited by this process as the ~~pr~~ sudden Expansion of the gases when the current is put on suddenly disrupts the conductor and devices have to be employed to put it on gradually to prevent the destruction of the conductor which is unnecessary by my process = I prefer to use iron for the reason that its resistance increases at a greater ratio with heat than platinum hence I can obtain a greater resistance with a smaller radiating surface than by the use of platinum or platinum iridium =

C is the burner ~~th~~ D the ~~pump~~ vacuum glass sealed with two platinum Conducting wire N & M welded in the tube & passing to the conductor, This tube is sealed to the pillar X. The heat from the tube Expands the air & this causes the sensitive diaphragm to work the circuit manipulating device Substantially as shown in my application

filed

Claim -

The Combination with a thermic regulator such as described of a sealed vacuum tube containing an incandescent Conductor.

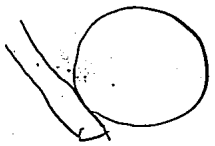
2nd The use of iron ~~nickel~~ nickel or cobalt as a material for giving light by incandescence when placed in a sealed vacuum ~~and~~ freed from gas substantially as described,

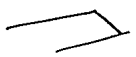
3rd The use of ~~the metals of the platinum group as a material~~ for of any conducting material for lighting by incandescence when the same is enclosed in a sealed vacuum and freed from gas as set forth =

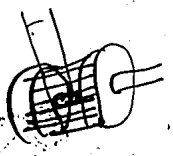
T A E

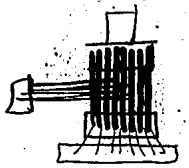
Feby 9 1879.

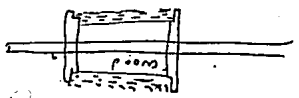
B. 22 & 24

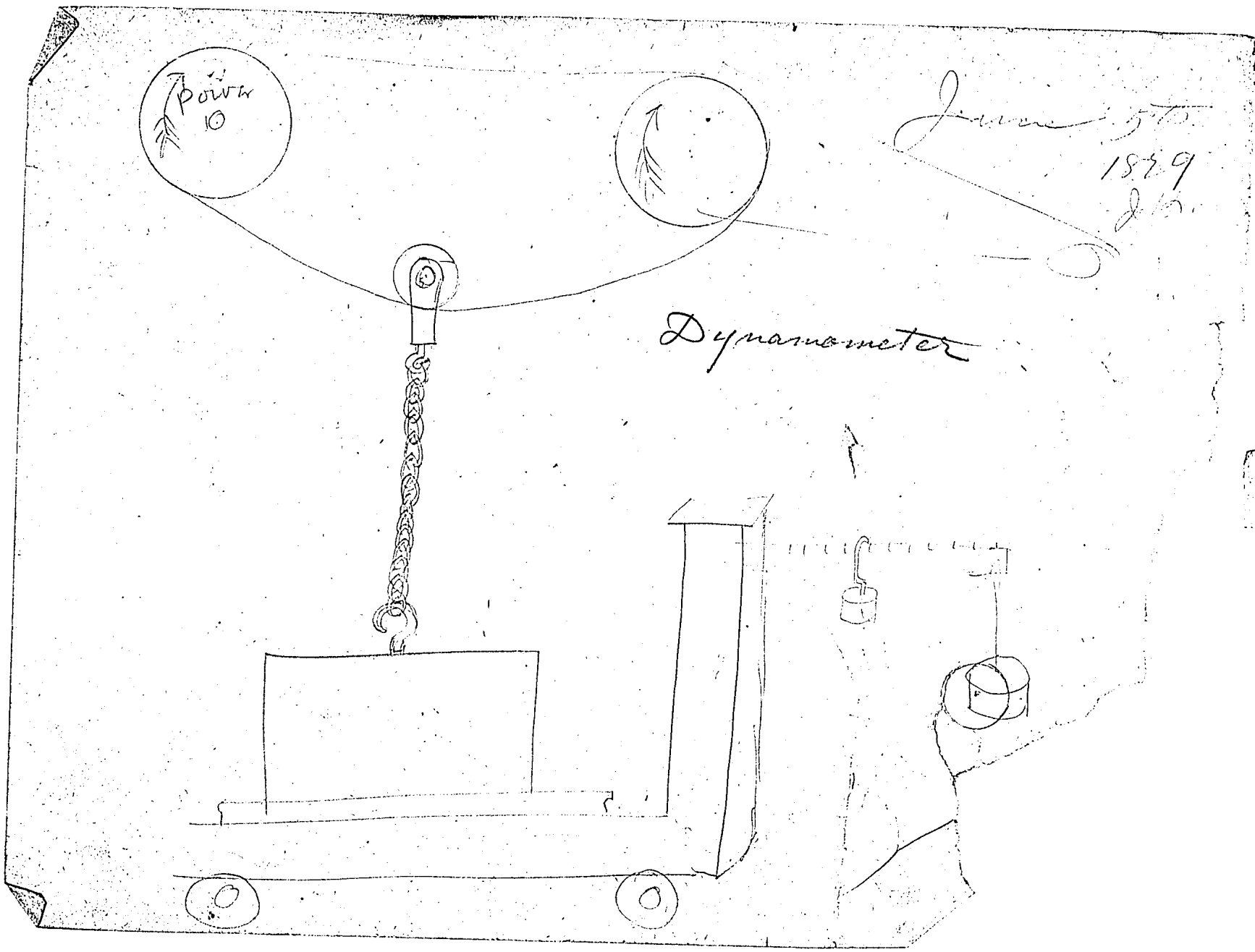


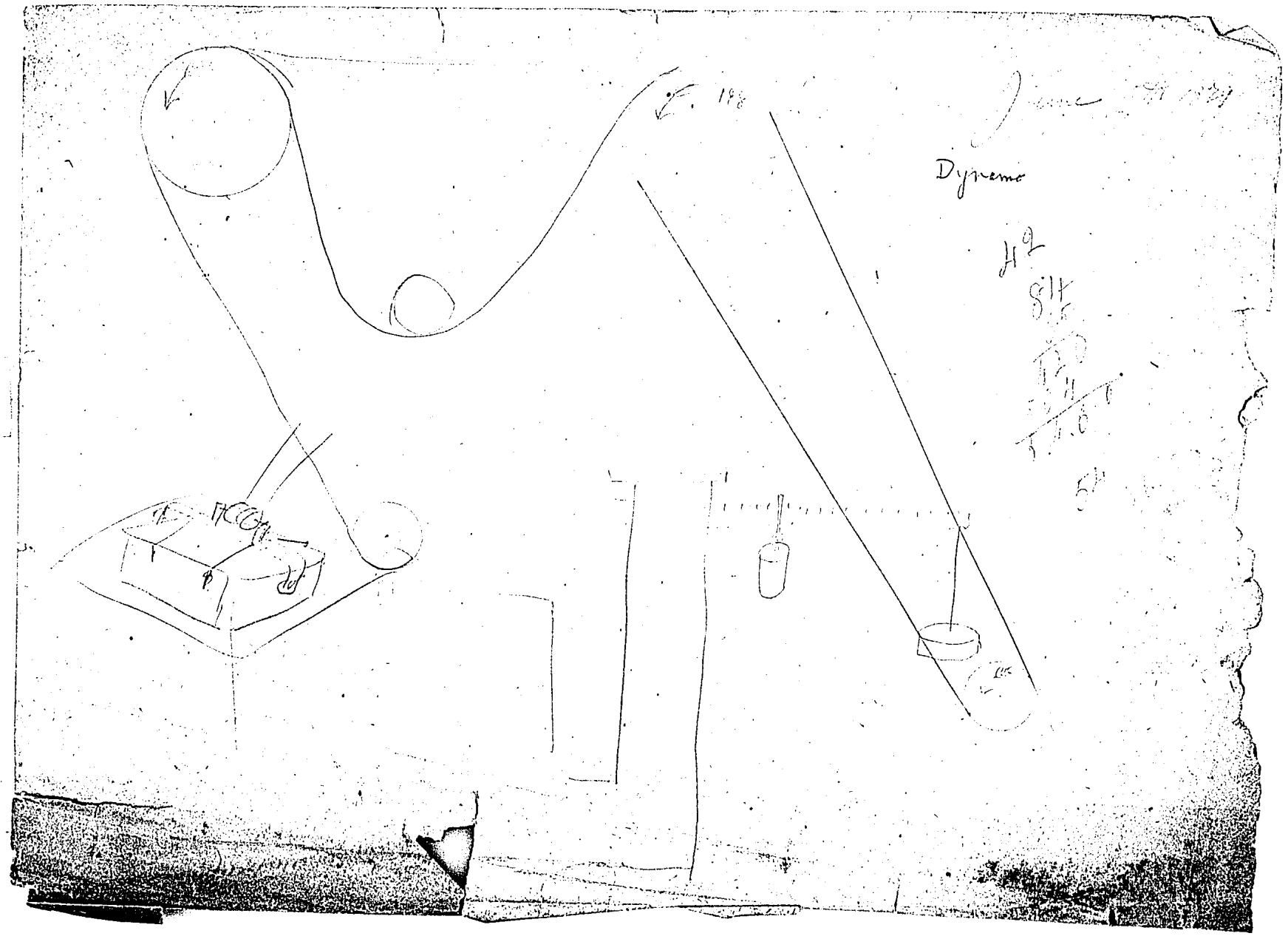








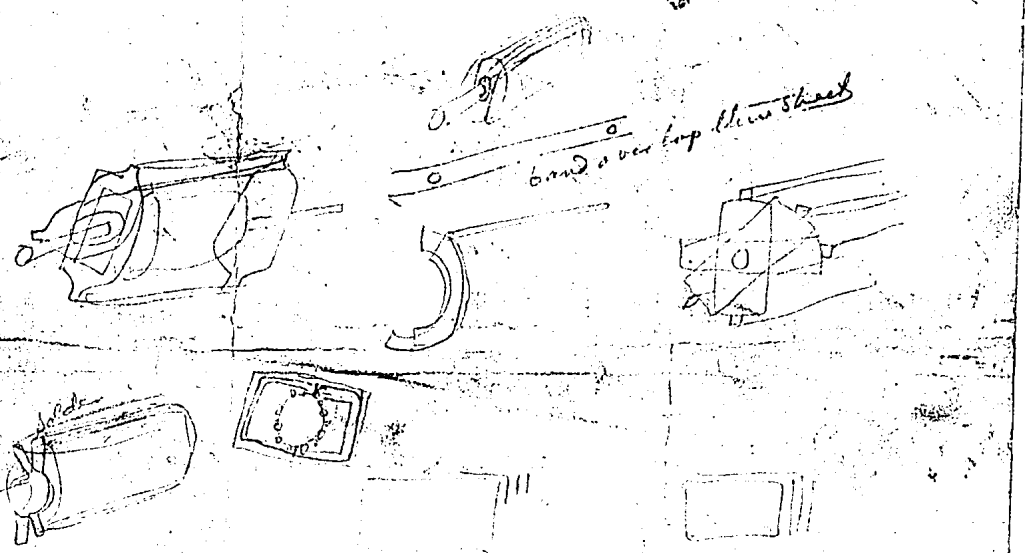

Power
10
1849
Dynamometer


Dynamo

UNBOUND NOTES AND DRAWINGS

1880

No. 22 12" [illegible] m. 1,50 [illegible]




January 10 1880

[ON BACK OF PRECEDING PAGE]


New York, Augt 14th 1879.

Mr T. A. Edison
Menlo Park N. J.

Dear Sir - Answering your Enquiry for price, Silk Covered platinum Incd. Wire. Would say that we can furnish the same in White Silk - as follows - the sizes numbers on the meant to the following Numbers, and our prices are based on them viz: Nos 15. 29. 36. -

price - 1.75 3.75 7.50 per lb.
1.25 2.57½ 5.34

discount 25 & 5%.

Of No 15. (about) - We can furnish 25 ft in a circuit a circuit and - the same and proportion thereafter

" " 29. " We can furnish 10 ft in a circuit, and 10 ft per circuit thereafter.

" " 36 - We could not furnish any within 2 weeks We of course guarantee quality of the wire and the very best workmanship.

Very Truly Ansonia Brass & Copper Co
Thos Lacy

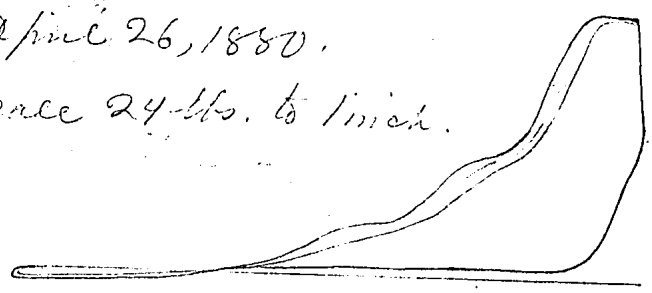
Lime Kiln. Newark.

Porter's Engine,

32 x 18.

April 26, 1880.

Scale 24 lbs. to 1 inch.



Lime Kiln, Newark.

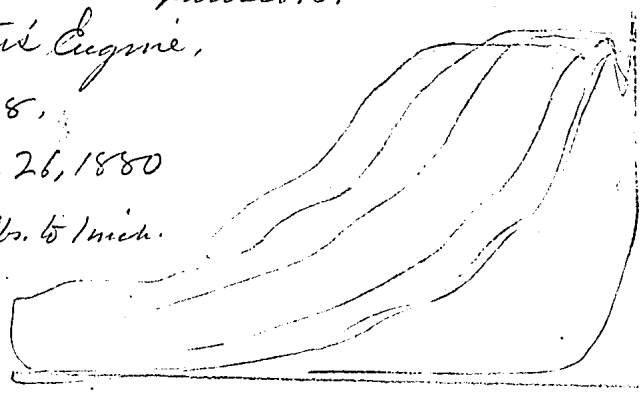
Governor lifted by engineer and allowed to fall, showing variable expansion.

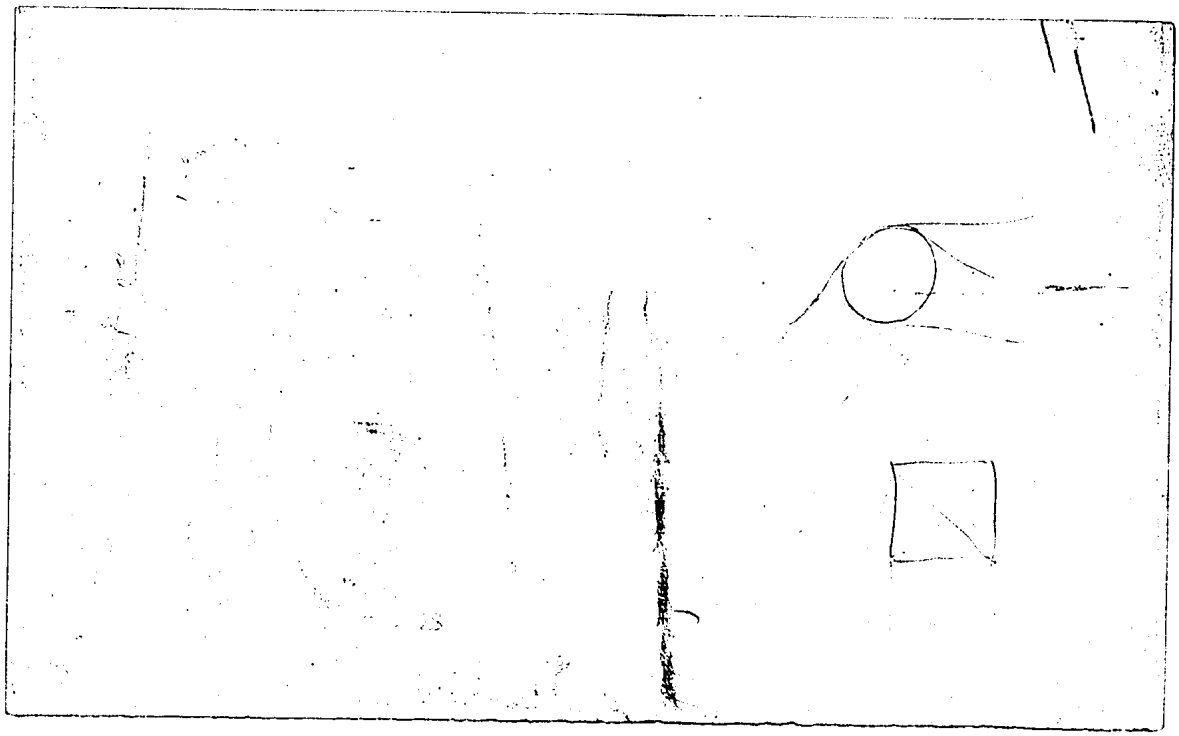
Porter's Engine,

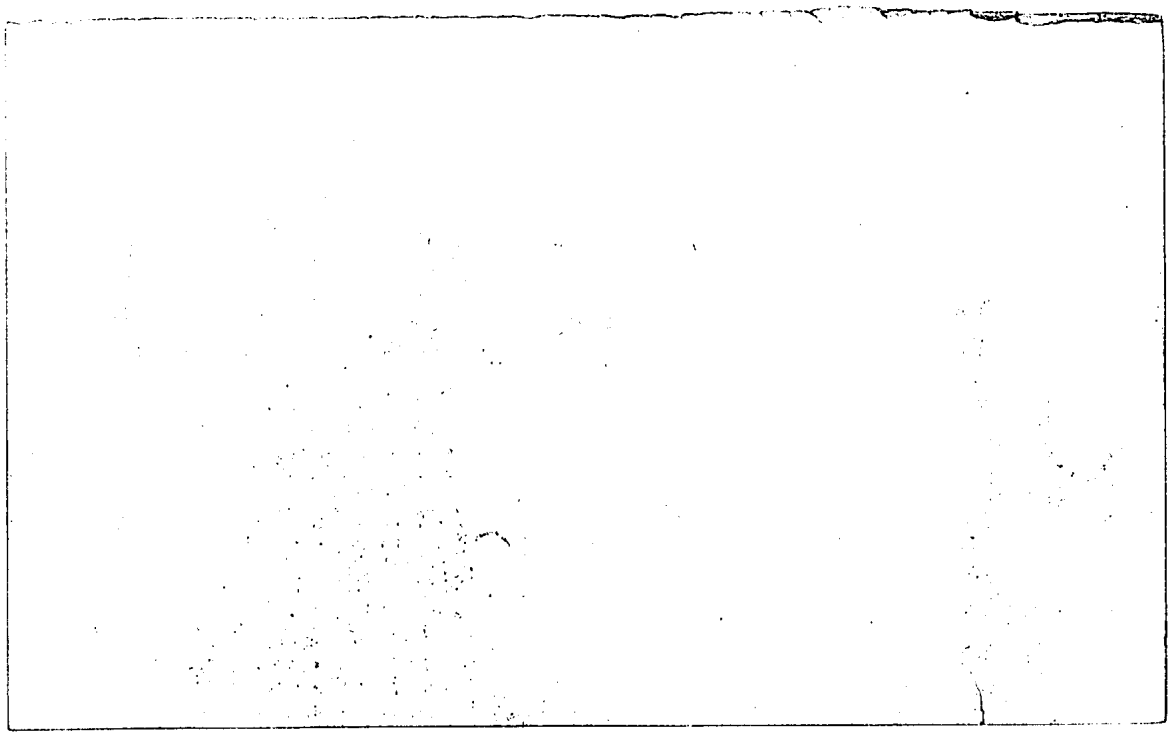
32 x 18.

April 26, 1880

Scale 24 lbs. to 1 inch.

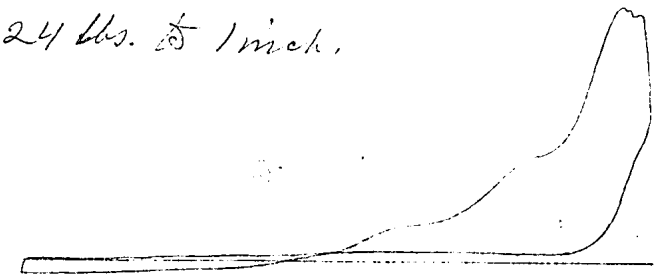






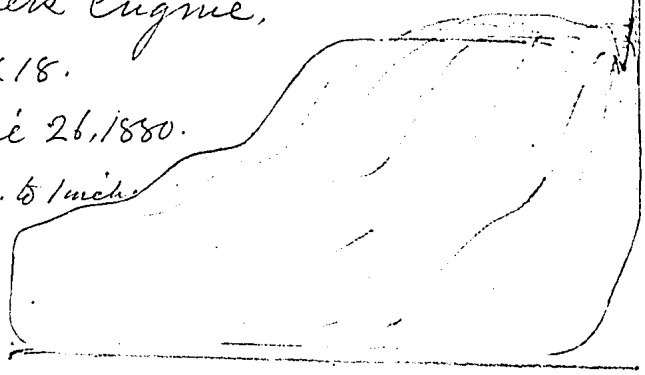
Limit Keen, Newark R.

Porter Engine.
32 X 18.
April 26, 1880.
Scale 24 lbs. to 1 inch.



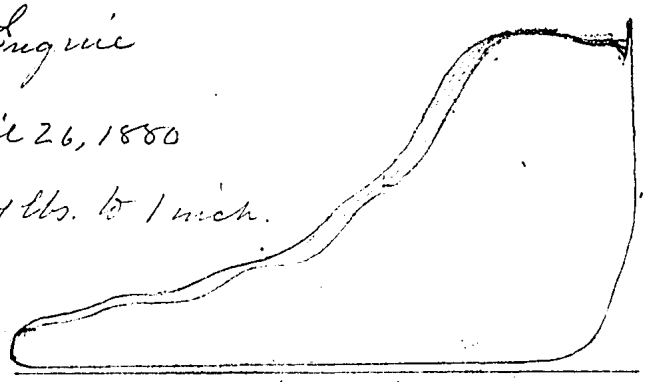
Limit Keen, Newark R.
Governor lifted by engineer and allowed to fall showing the variable cut-off.

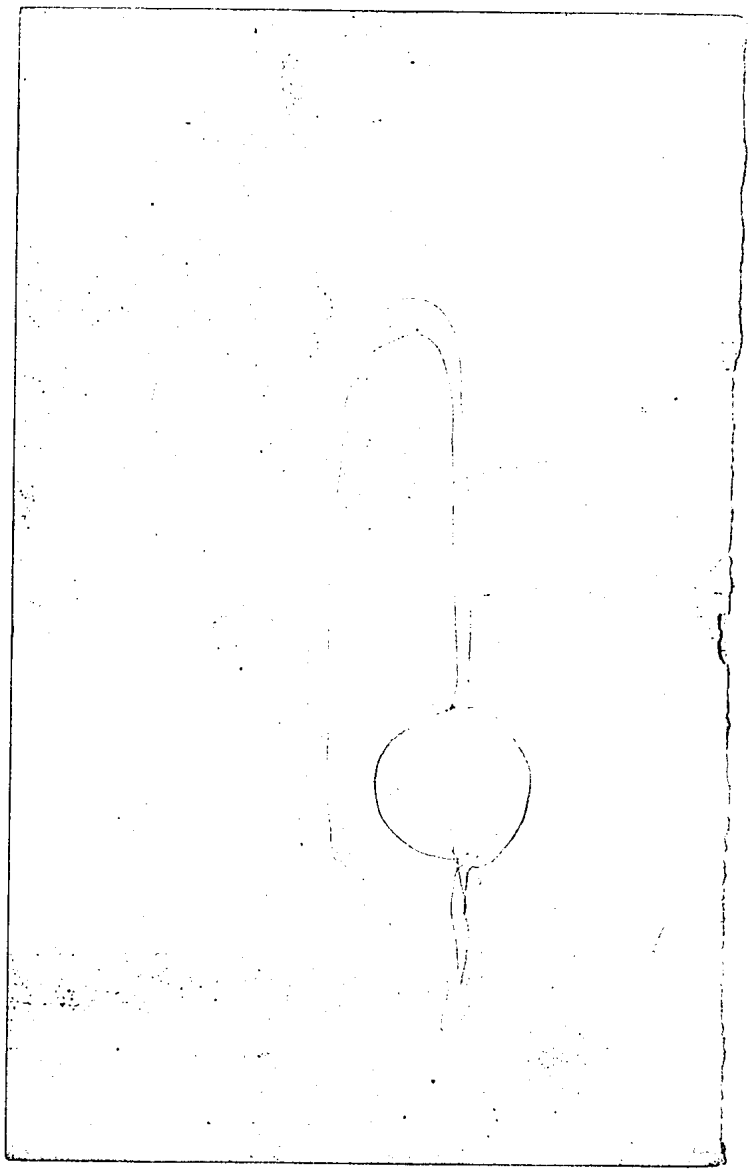
Porter Engine.
32 X 18.
April 26, 1880.
Scale 24 lbs. to 1 inch



Lewis Keen, Newark.

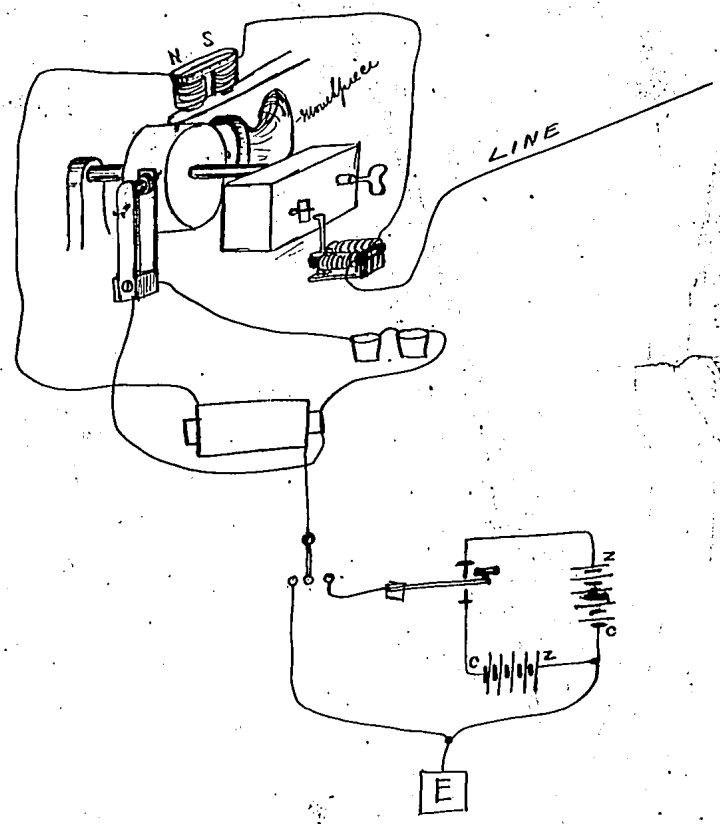
Portable Engine
32 × 18
April 26, 1880
Scale 24 lbs. to 1 inch.





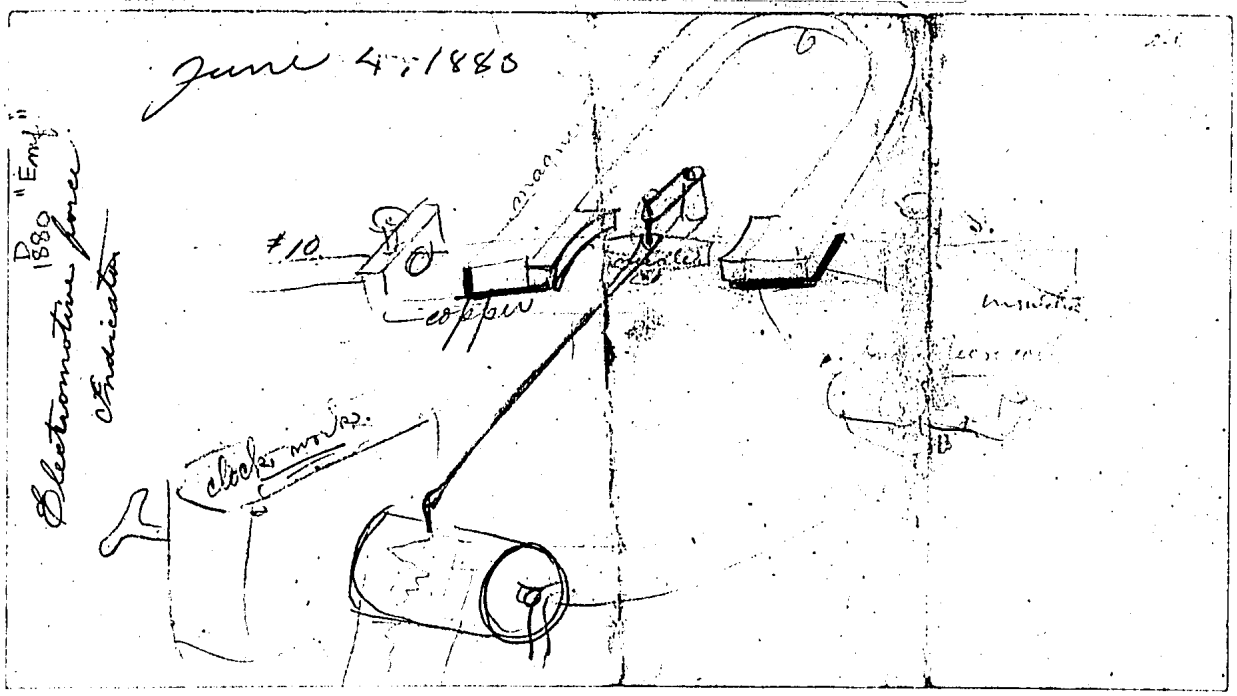
Chas Batchelor

May 18th 1880.




Phonograph as transmitter

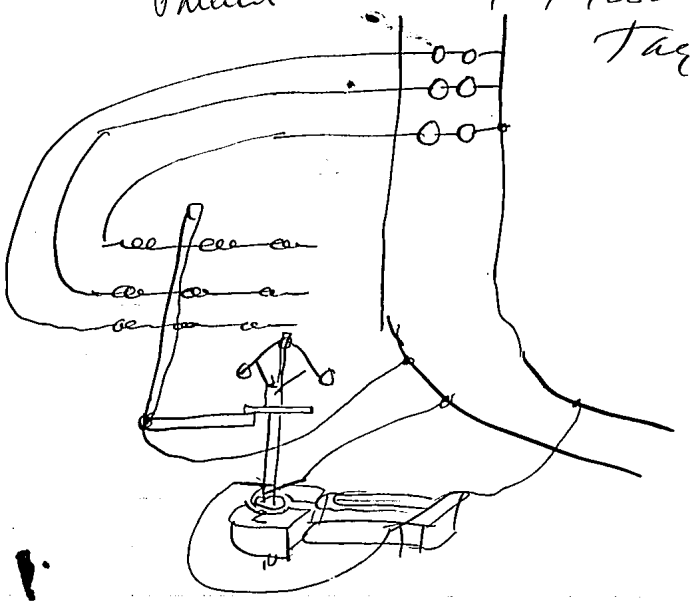
June 4, 1880



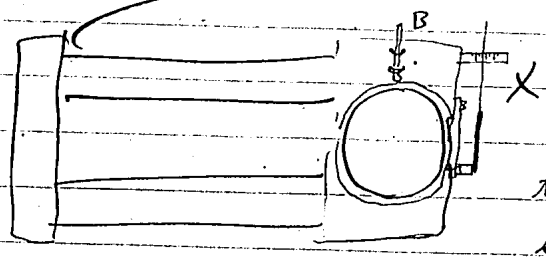
T. A. EDISON,

Menlo Park, N. J., 1880

Patent Aug 24 1880

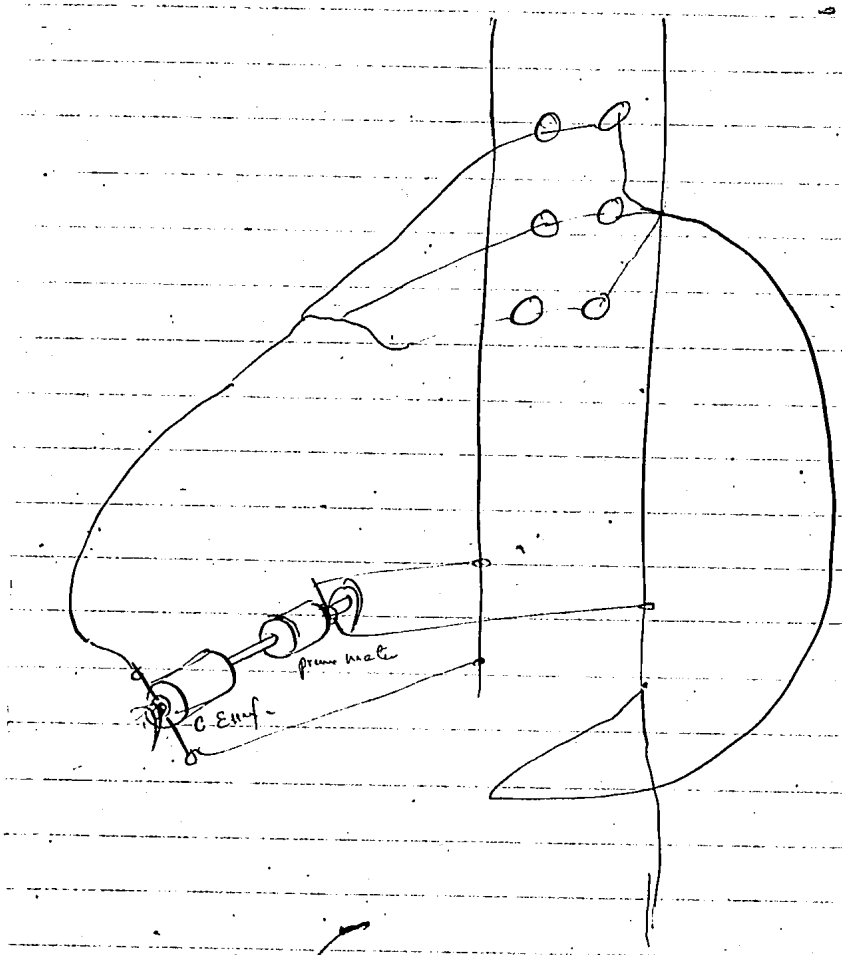


Patent



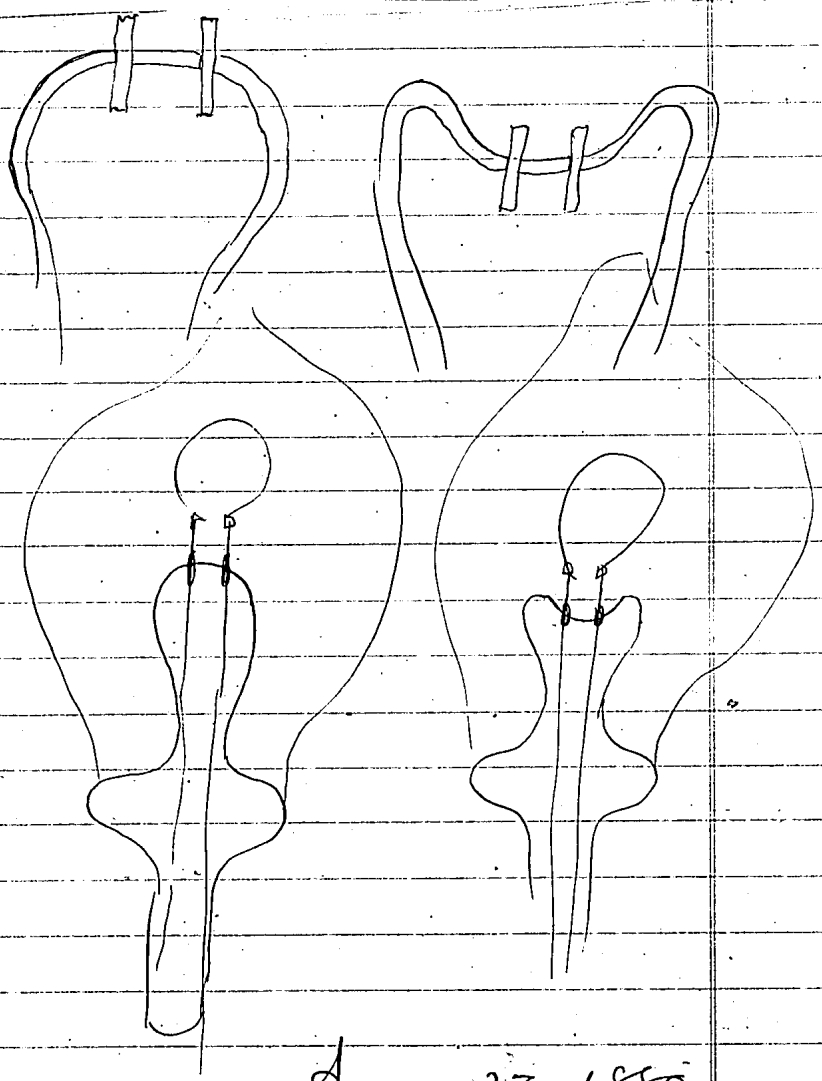

to ascertain if magnet is
strong or weak -
B a thermometer for reading
at any time temperature
over from 60 to 66 in to ascertain
its heat -

Aug/27 1850
TAE

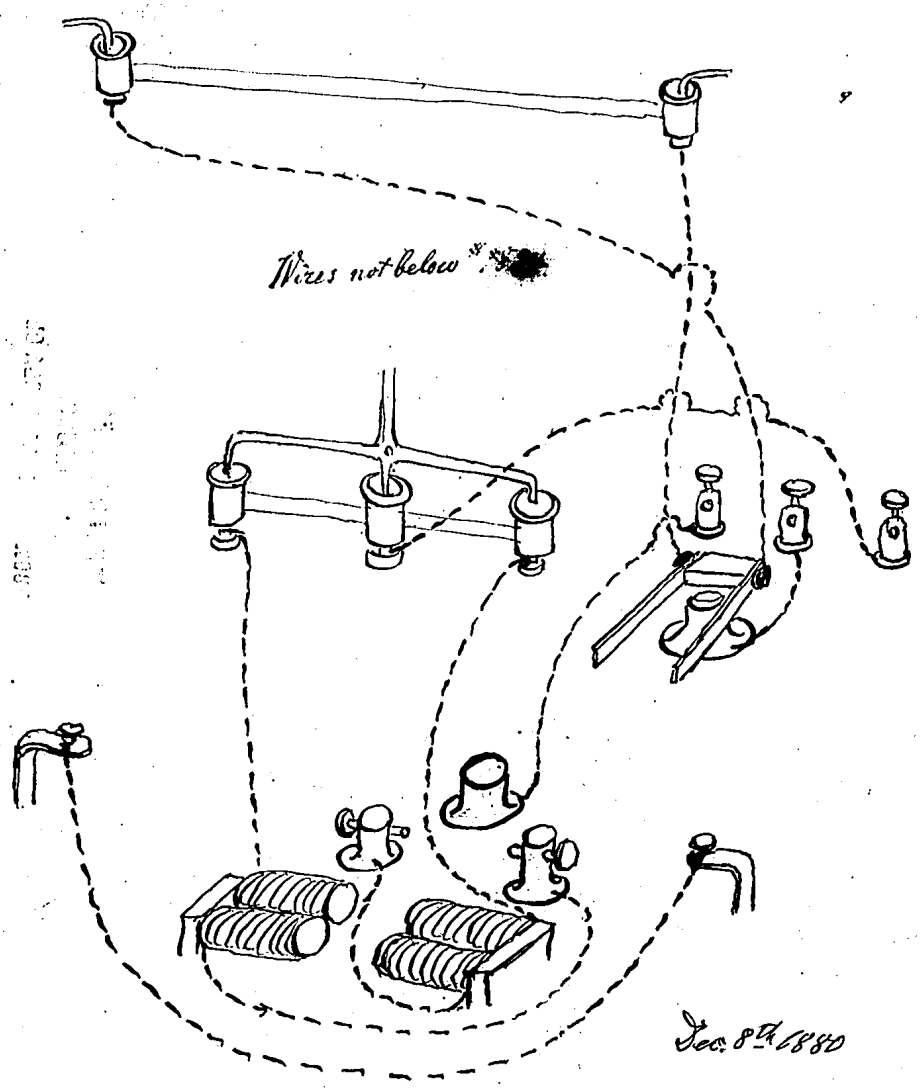



Auto Regulation
by Counter E.M.F.

Aug 27 1880 Tai

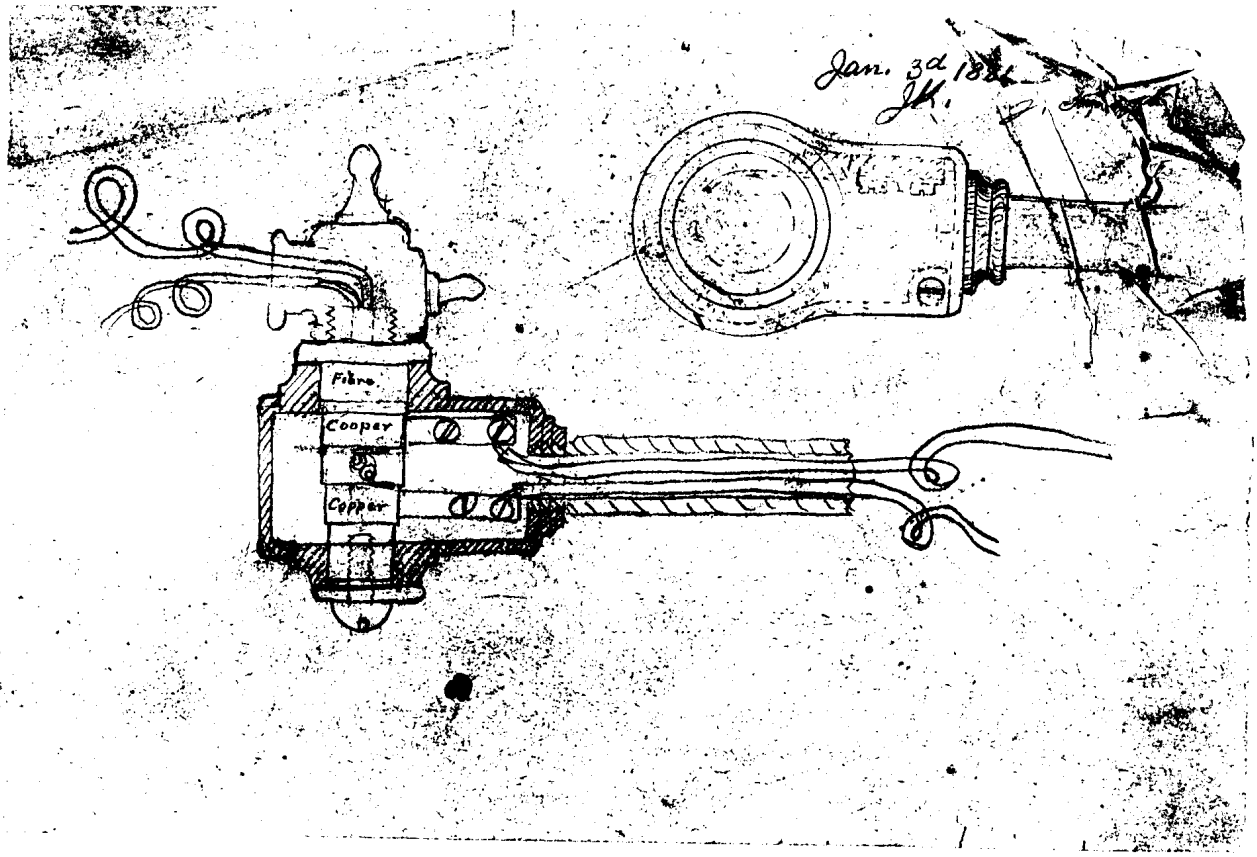


patent Aug 27 1880
T a f

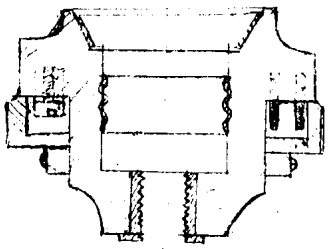

Wires not below
Dec. 8th 1880

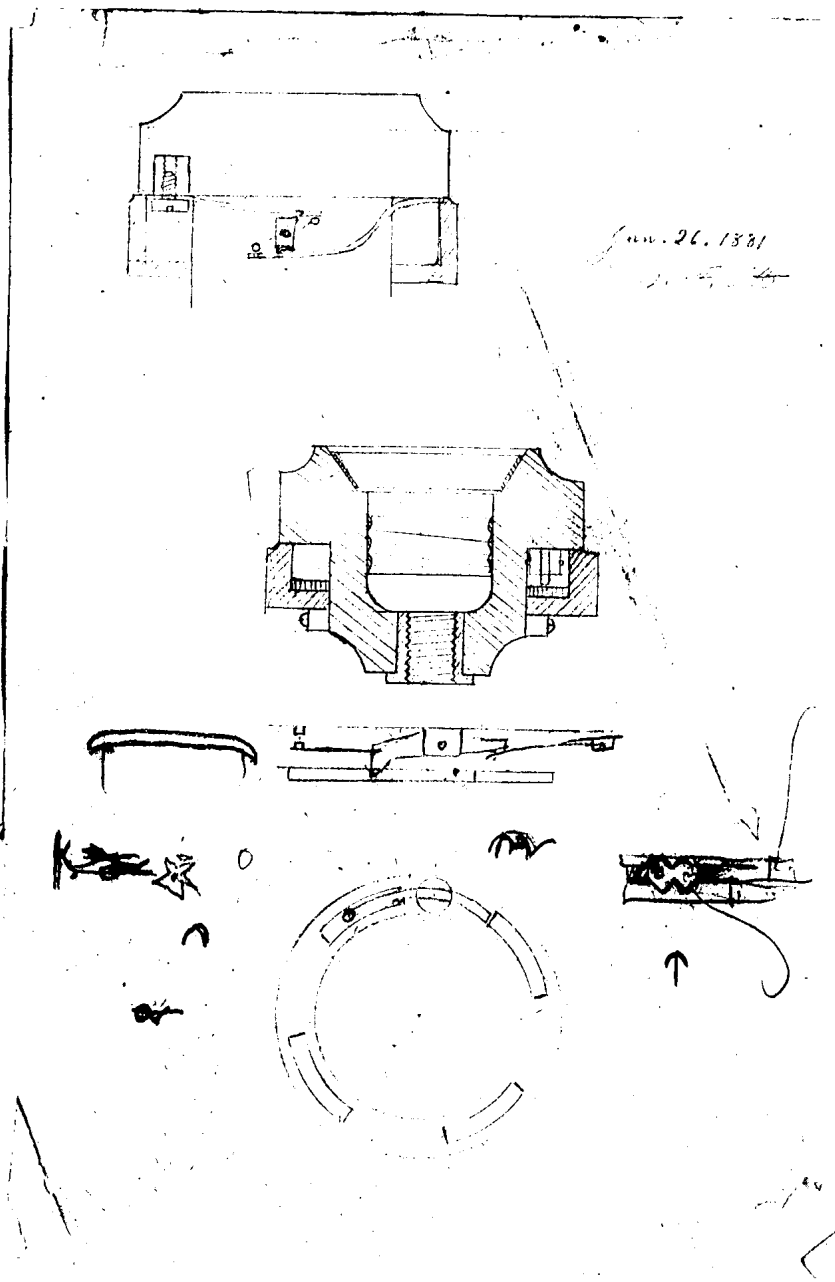
UNBOUND NOTES AND DRAWINGS

1881

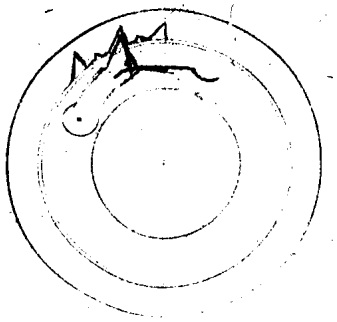

Jan. 3d 1882
JK.
Fibre
Cooper
Copper

Jan. 26. 1831

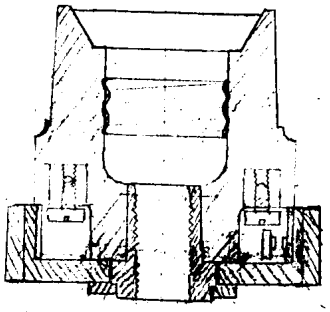


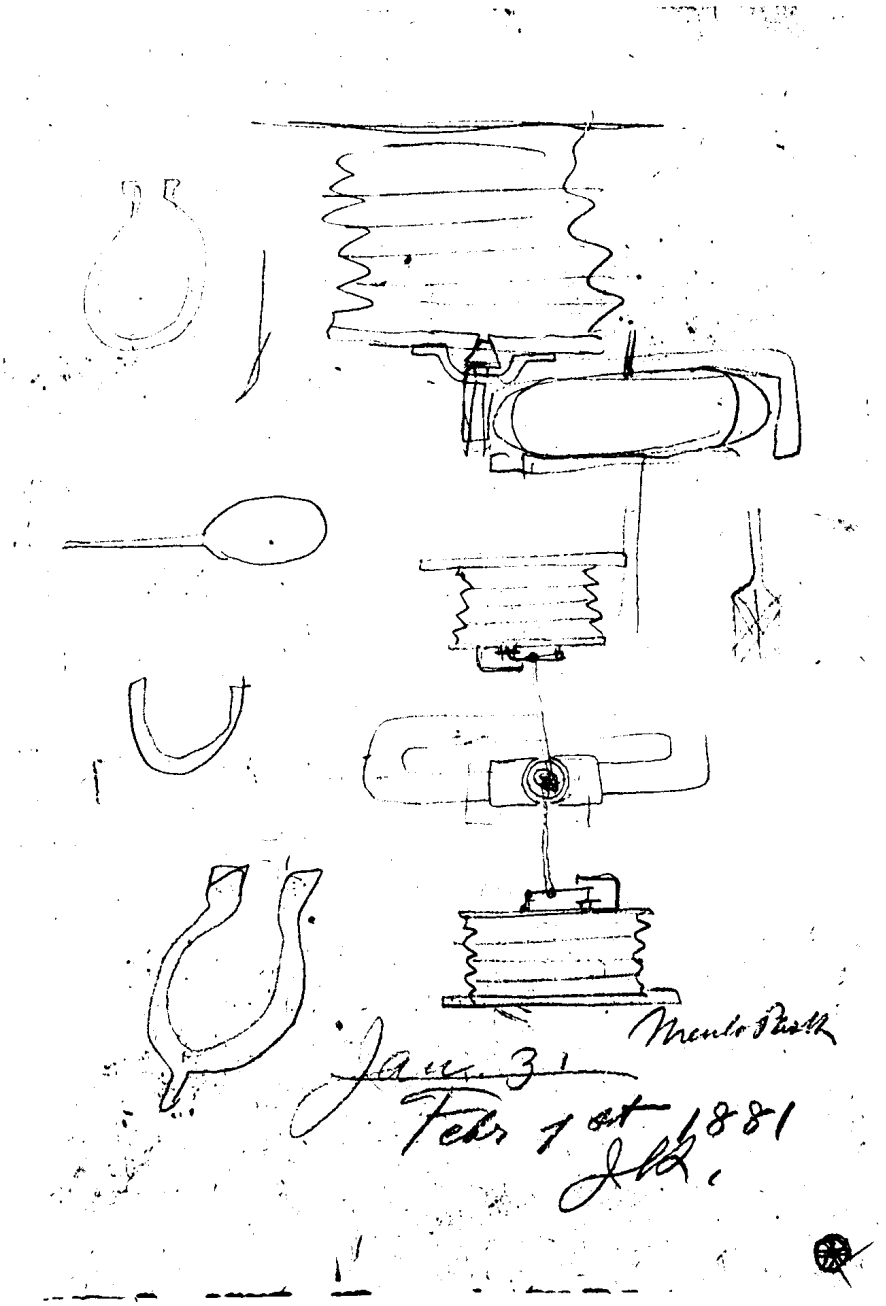


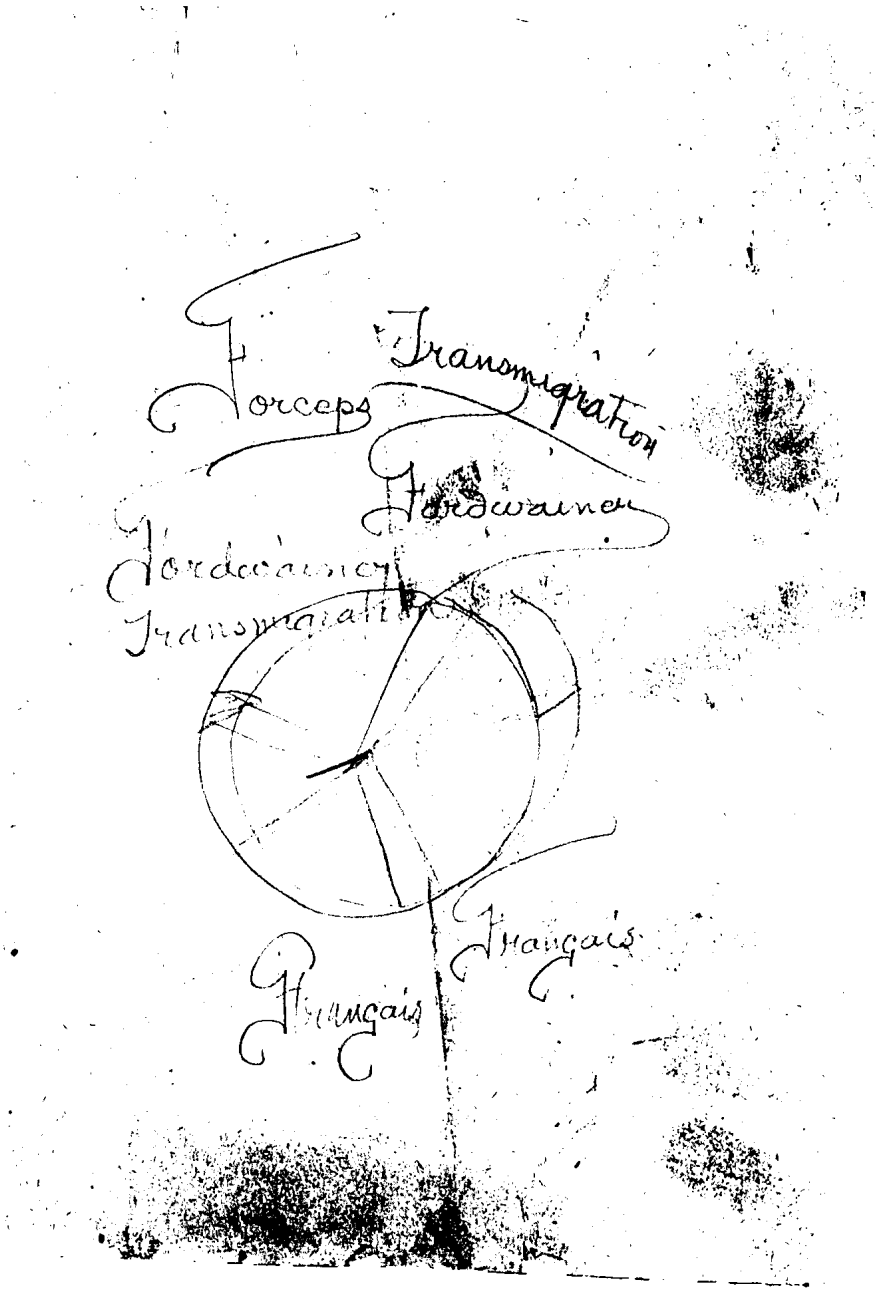
Jan. 26. 1831



Jan 26. 1881
J. F. Otis



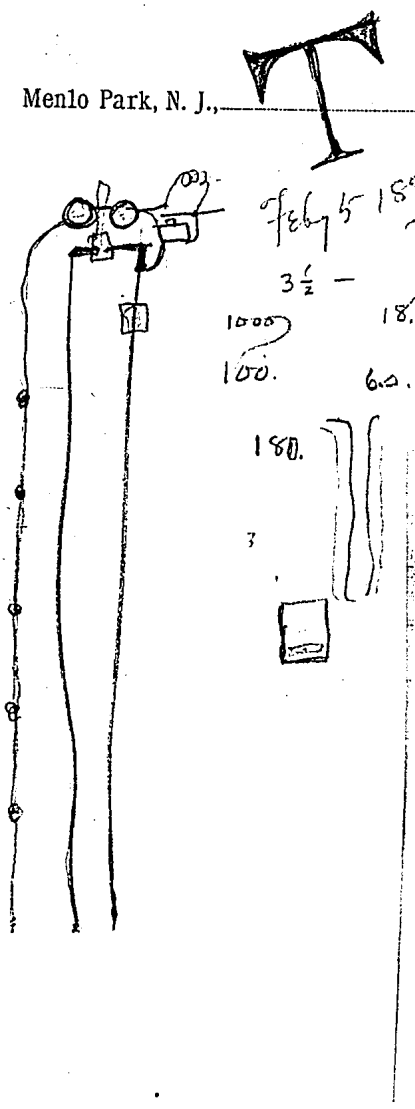

Jan 31
Feb 1st 1881


Forceps
Transmigration
Hordeaumen
Hordeaumen
Transmigration
Français
Français

THE EDISON ELECTRIC LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

Menlo Park, N. J., ..... 188

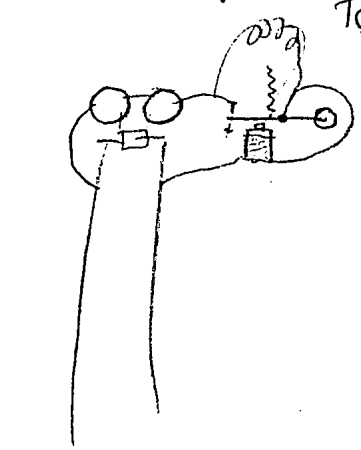


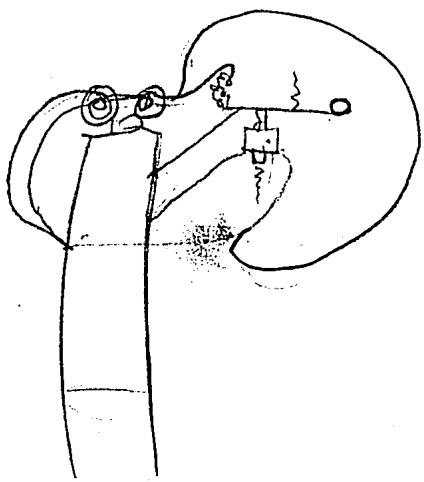

THE EDISON ELECTRIC LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

Menlo Park, N. J., Feby 5– 1881. 188

T A Edison





# THE EDISON ELECTRIC LAMP CO.,

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

Menlo Park, N. J., Feb 5 1881 188

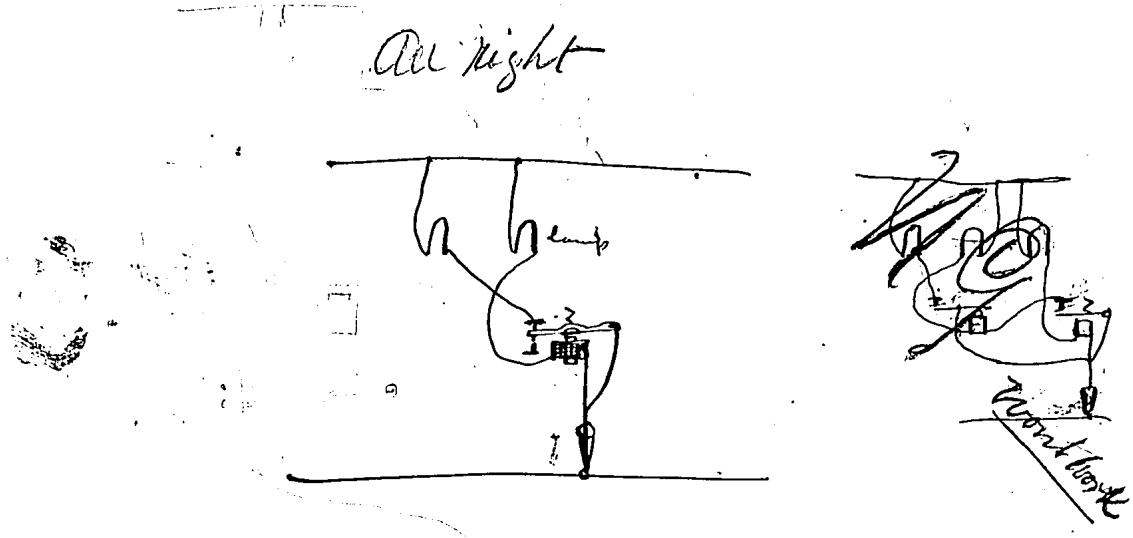
TAE

THE EDISON ELECTRIC LAMP CO.

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson,

Menlo Park, N. J.

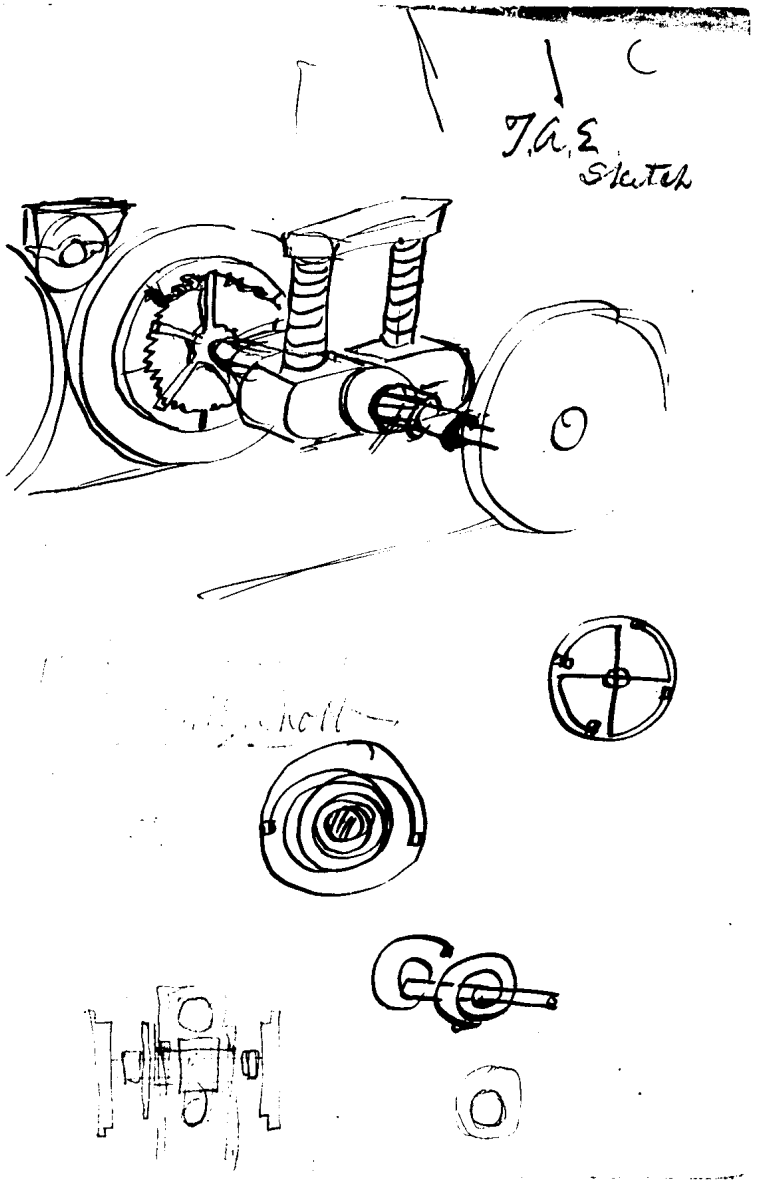
All right

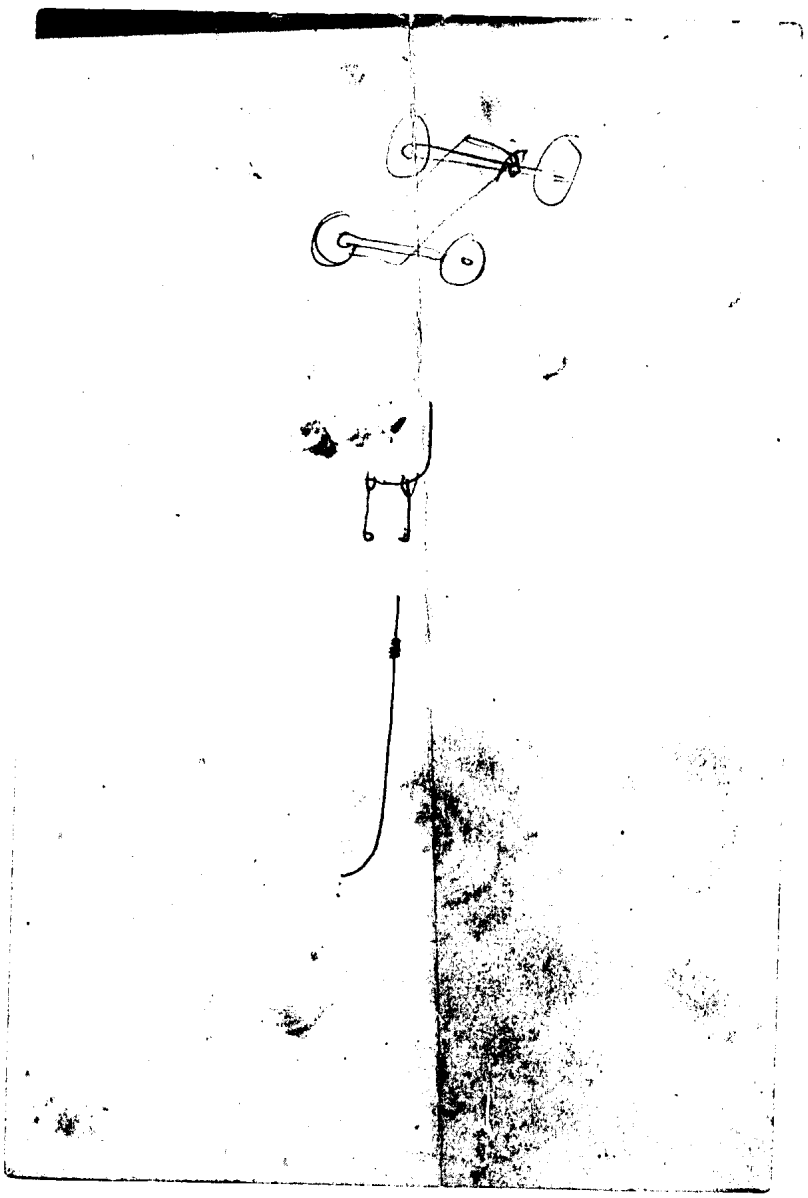



April 2nd 1881

Matt have me get this
J. P. Morse ... to for automatically throwing in
... other lamps when one breaks

J. A. E.


T.A.E
Starter



T. A. EDISON,

Telephone transmitter

Menlo Park, N. J., 1881.

June 8th 1881

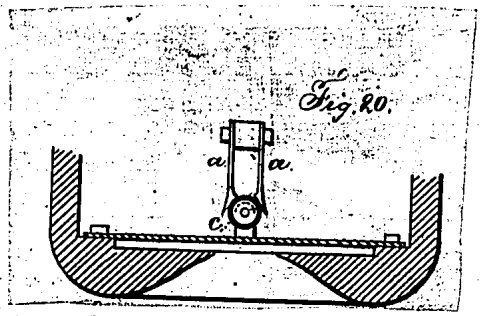


Fig. 20.

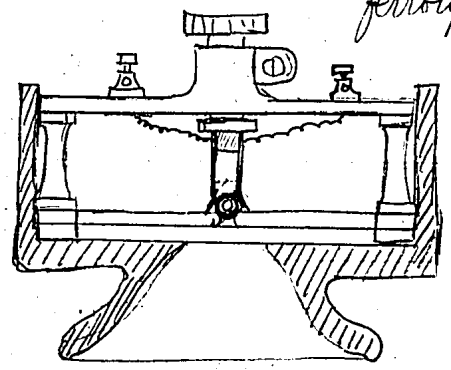
Make 1 of this

C carbon hollow to make less weight

Diaphragm ordinary ferrotype plate .008

a a german silver springs platina points

Both Pins jack-insulated



Chas Batchelor for L.A.E.

T. A. EDISON,

1 Telephone transmitter

Menlo Park, N. J., 1881.

S. light spring

A Weight brass cupped out

9 Hard rubber cup

e Carbon

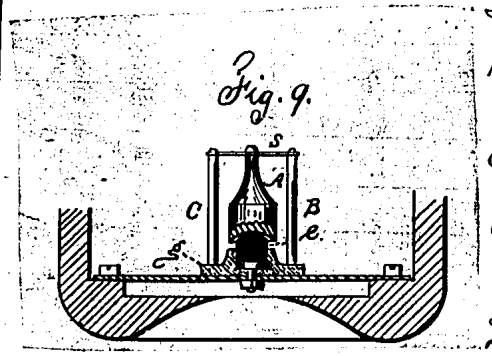
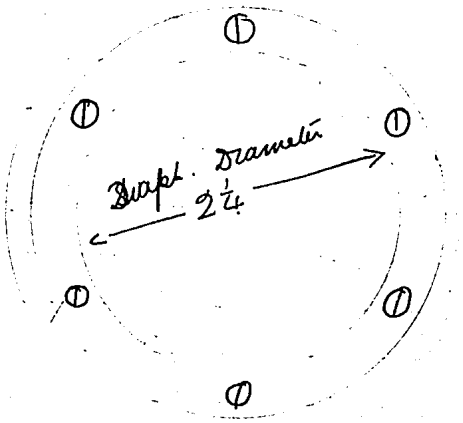


Fig. 9.

Diaphragm of ordinary ferrotype plate



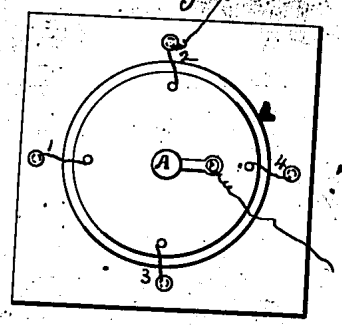

Chas Batchelor for L.A.E.

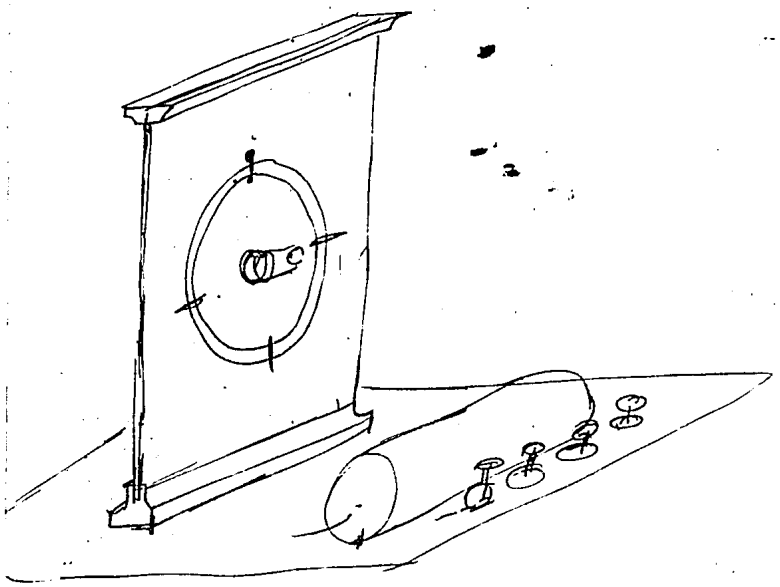
T. A. EDISON,

Telephone transmitter

Menlo Park, N. J., ..... 1881.

Fig. 10.

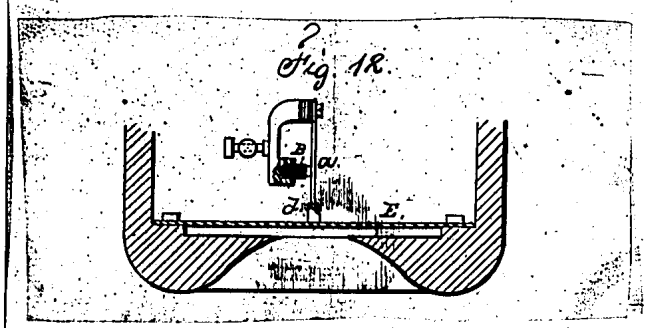



T. A. EDISON,

Menlo Park, N. J., ..... 1881.

Fig. 1R.

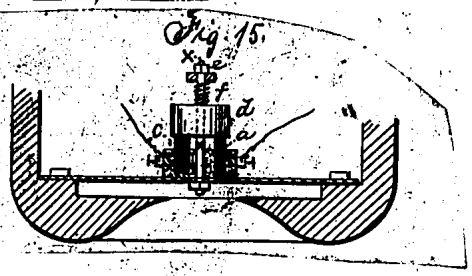


T. A. EDISON,

Menlo Park, N. J., ..... 1881.

Telephone

Fig. 15.

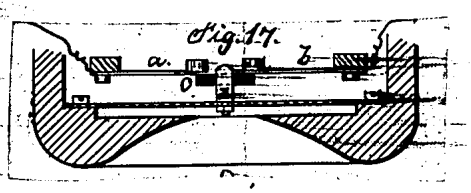


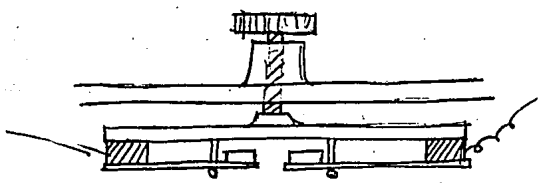

T. A. EDISON,

Menlo Park, N. J., ..... 1881.

Telephone

Fig. 17.

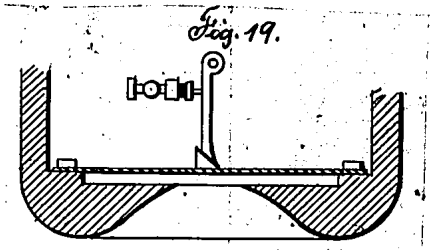


T. A. EDISON,

Menlo Park, N. J., ..... 1881.

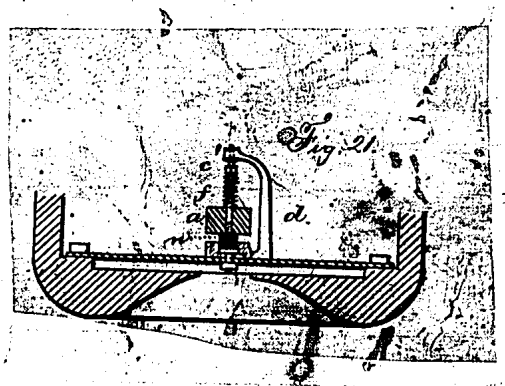
Fig. 19.



T. A. EDISON,

1 Telephone Transmitter

Menlo Park, N. J., ..... 1881.




A very light upright ——
a brass weight
f spring light
c collar to adjust spring

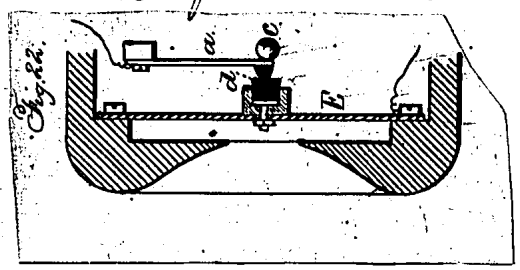
Diaphragm ordinary ferrotype
of 1/4 in the clear

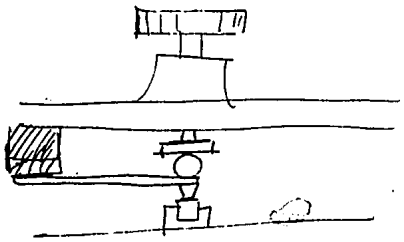
Chas Batchelor
for E.A.E.

T. A. EDISON,

Menlo Park, N. J., ..... 1881.

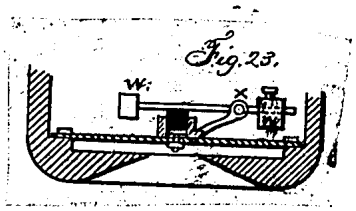
Telephone -



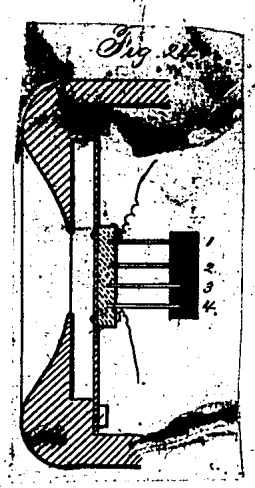
T. A. EDISON,

Menlo Park, N. J., ..... 1881.

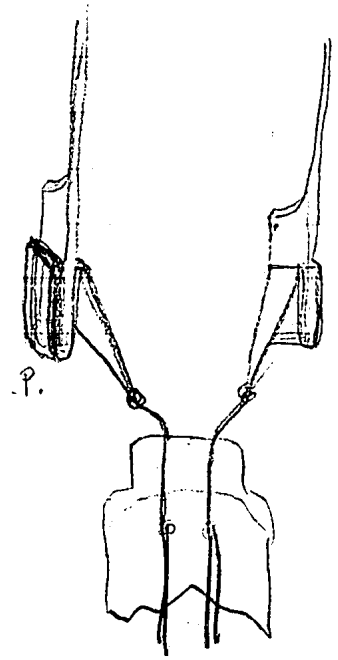


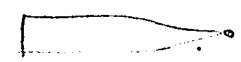
T. A. EDISON,

Menlo Park, N. J., ..... *1881.*

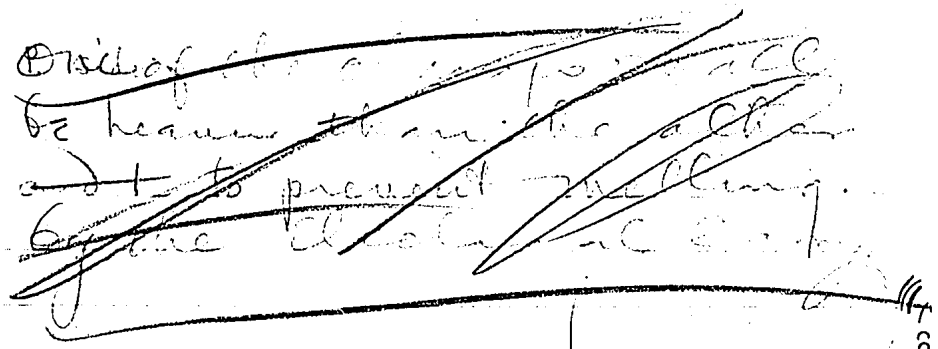


Nov 25, 51

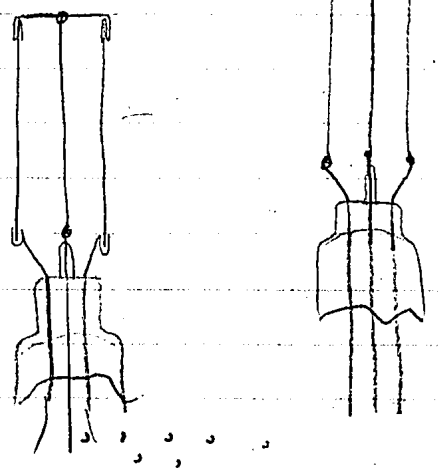


patent.



Nov 25, 51.

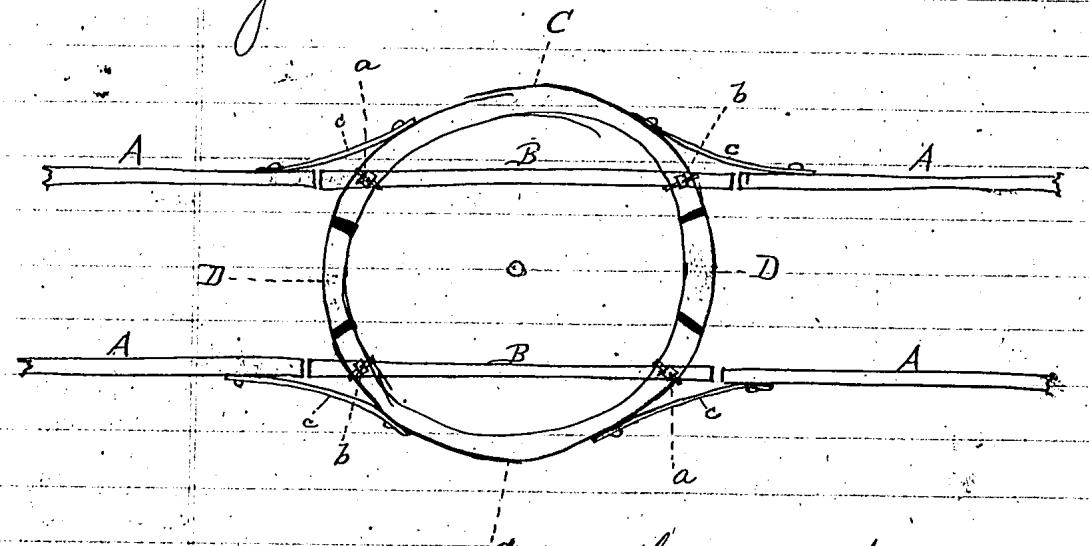


patent

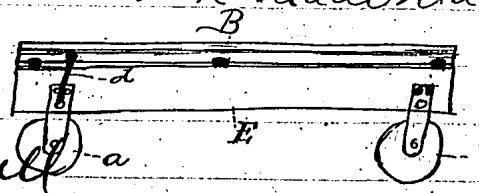
UNBOUND NOTES AND DRAWINGS

1882

Electrical Connections for Turn-Table of Electric Railroad



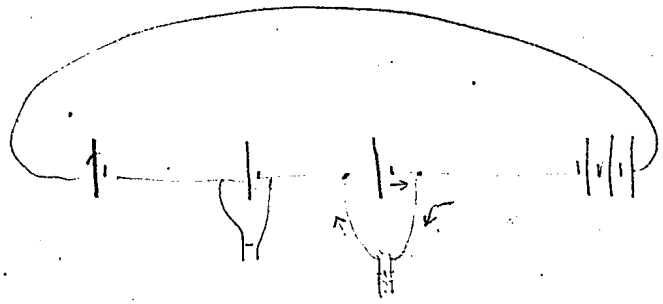

Connections made at Menlo Park March 13th 1882 in Turn Table. Sketch made March 19th 1882.

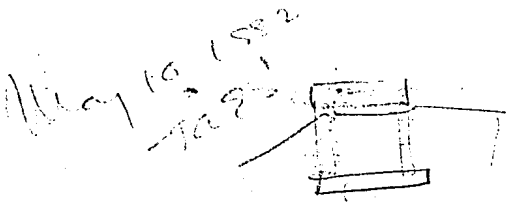


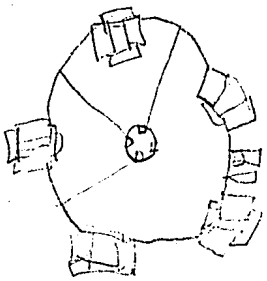

Witness
Paul Jusell
19th Mar 82.

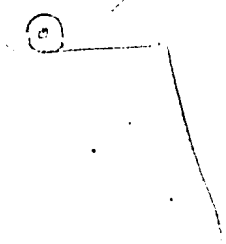
Chas. T. Hughes

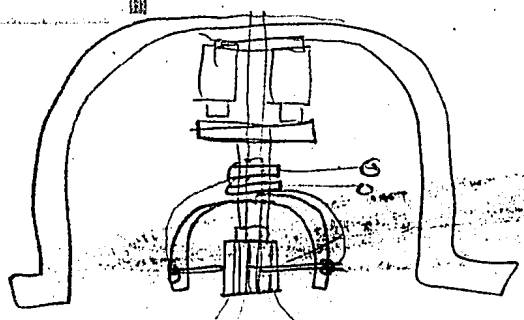
A Represents main tracks; B Represents tracks of Turn Table, supported on timbers E of Turn Table; a Represents casters connected electrically with rails B by wires d; b represents insulated casters; C represents sections of stationary circular track upon which casters a, b travel; c represents connections between tracks A and sections C; D insulated sections of sufficient width to prevent short circuit when Turn Table is moved



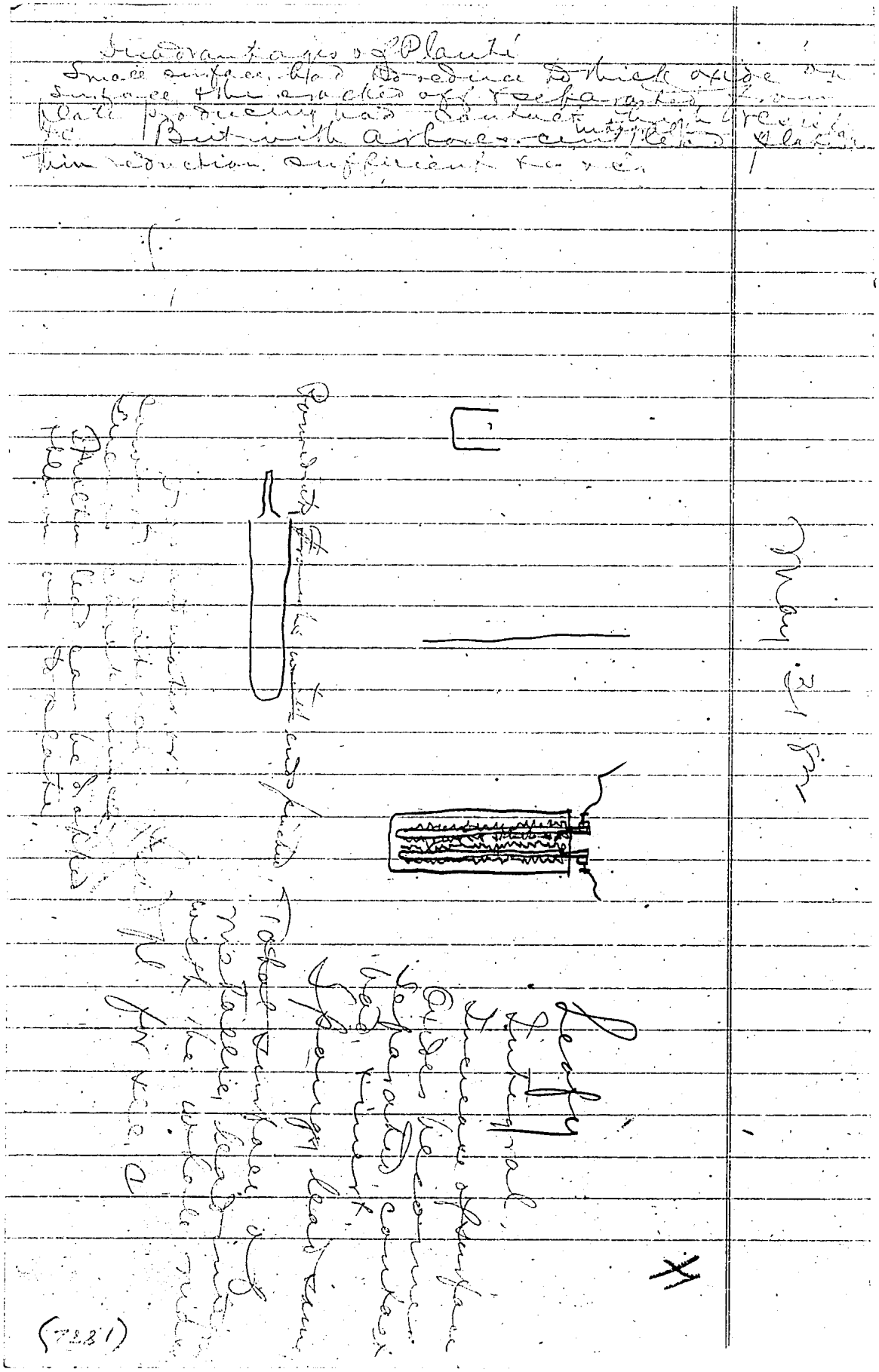


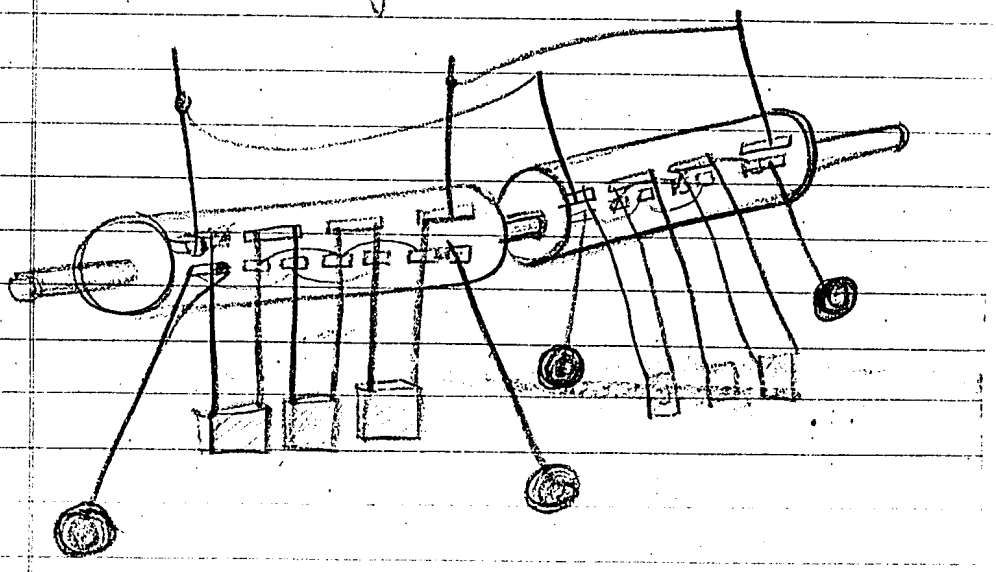


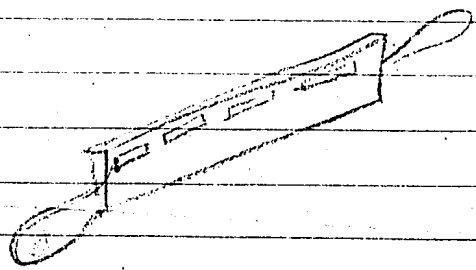




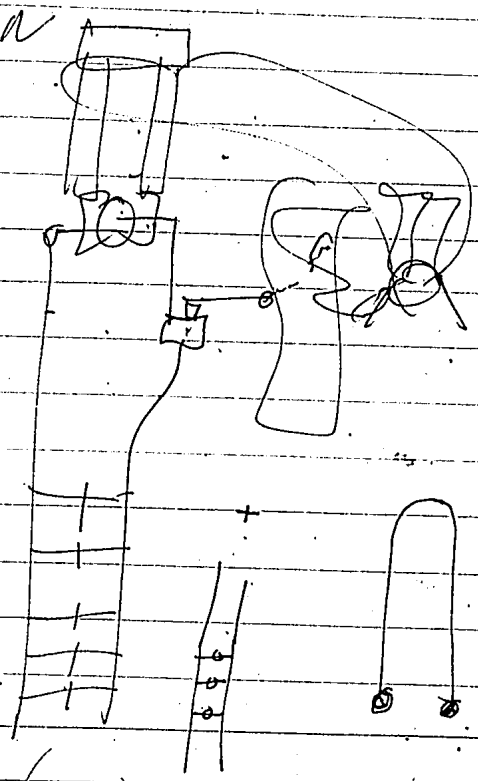
May 10 1982







Several Circuits
J.T. Jane, 85

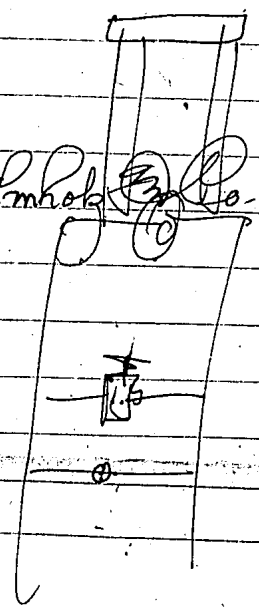


1 2.

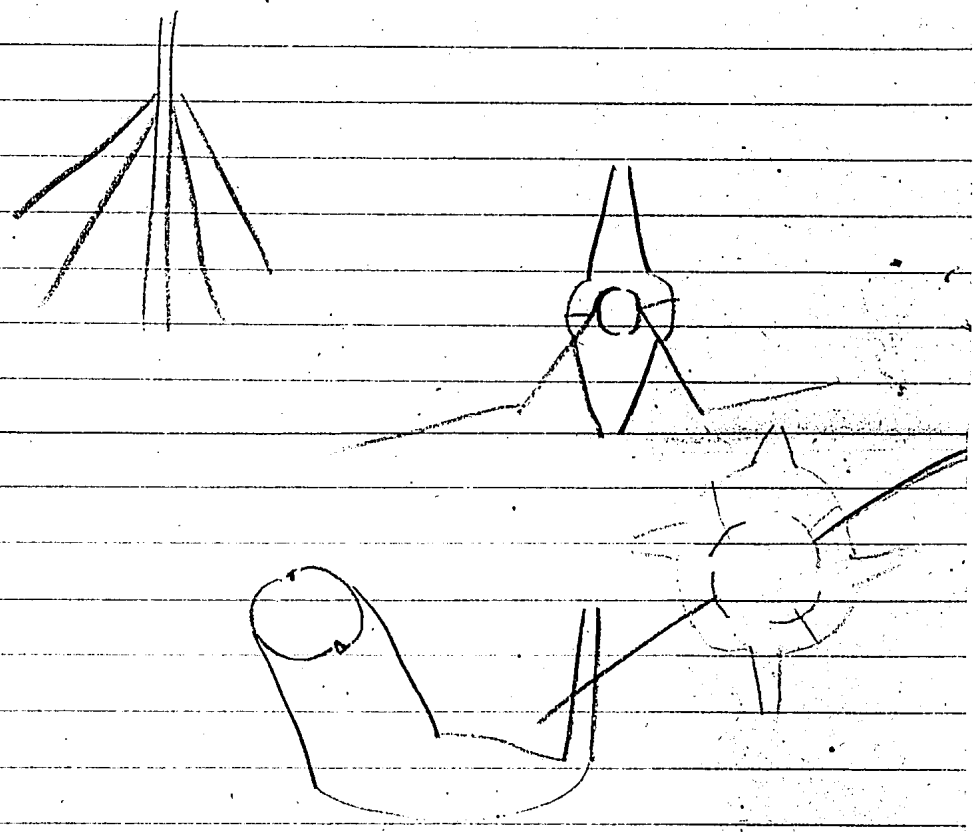
Amoeys

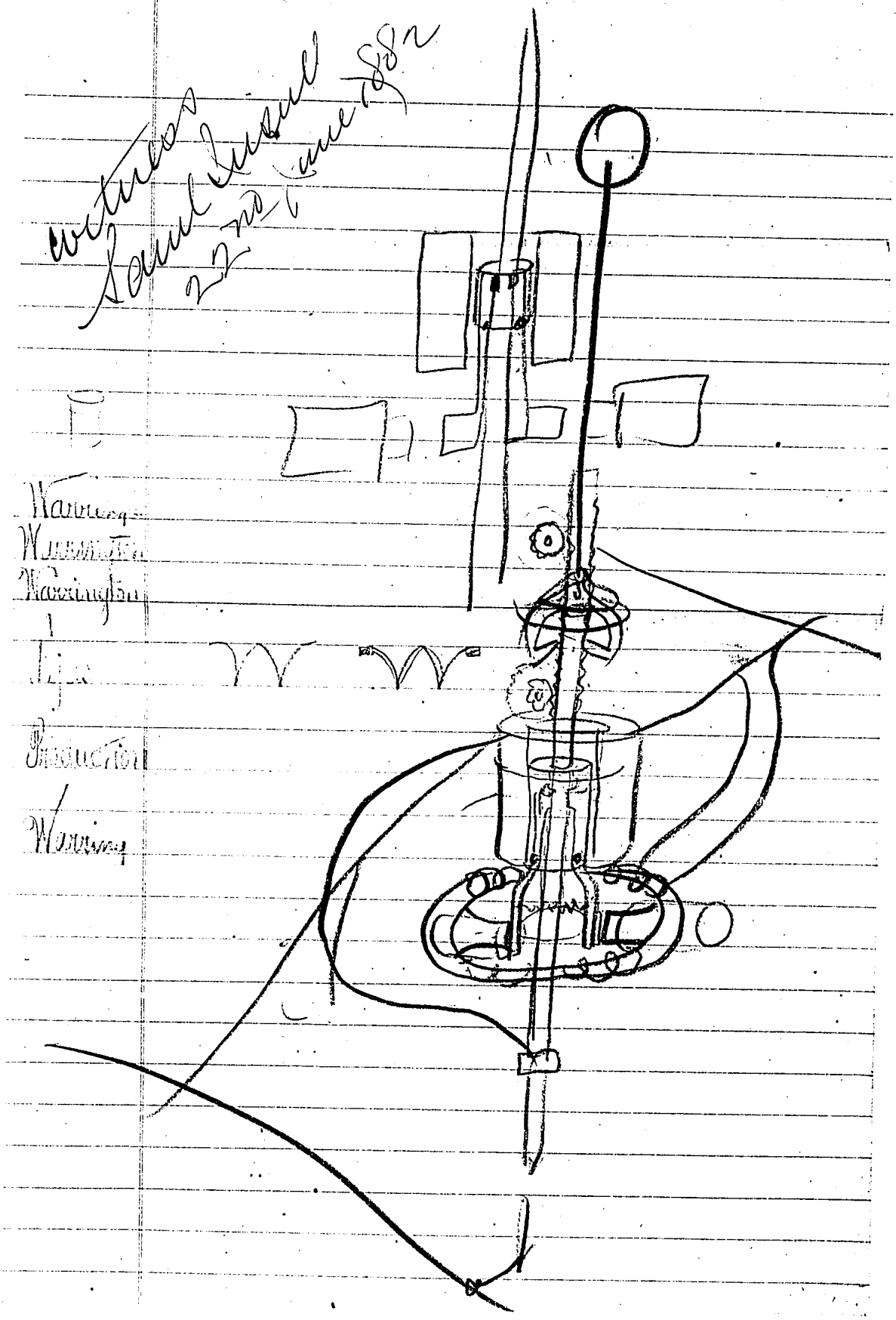
Anderson

Tredegar Holmhold Co.

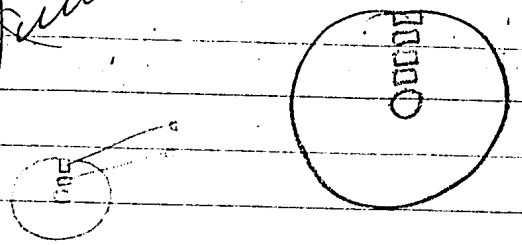


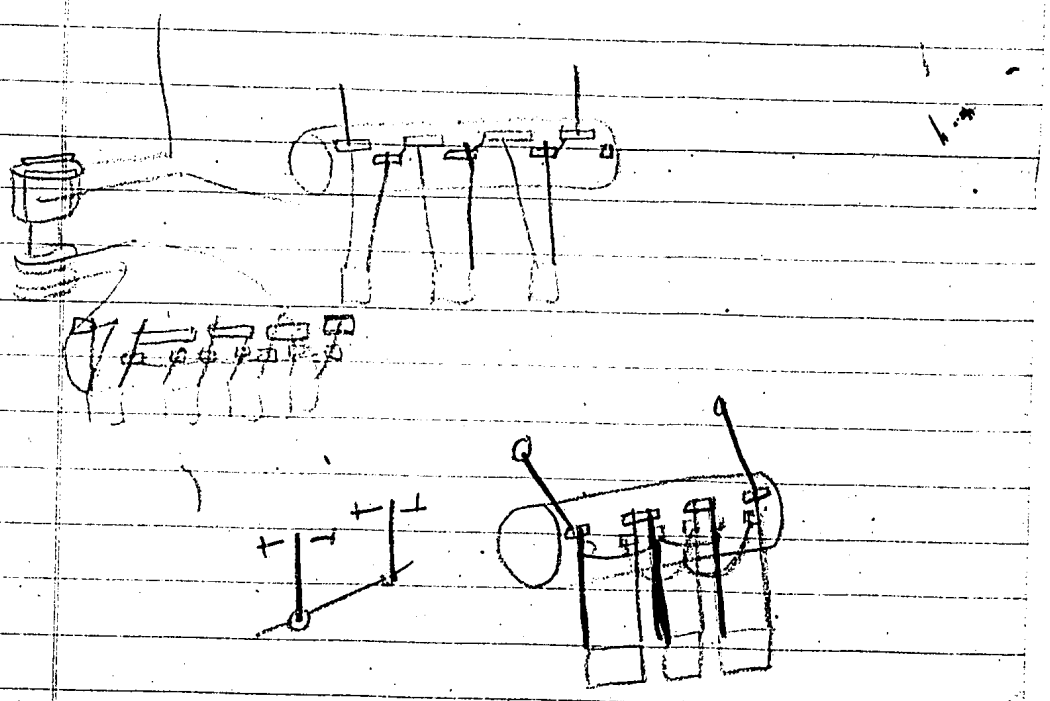
Victuees
Saml Lucas
27 June 1882





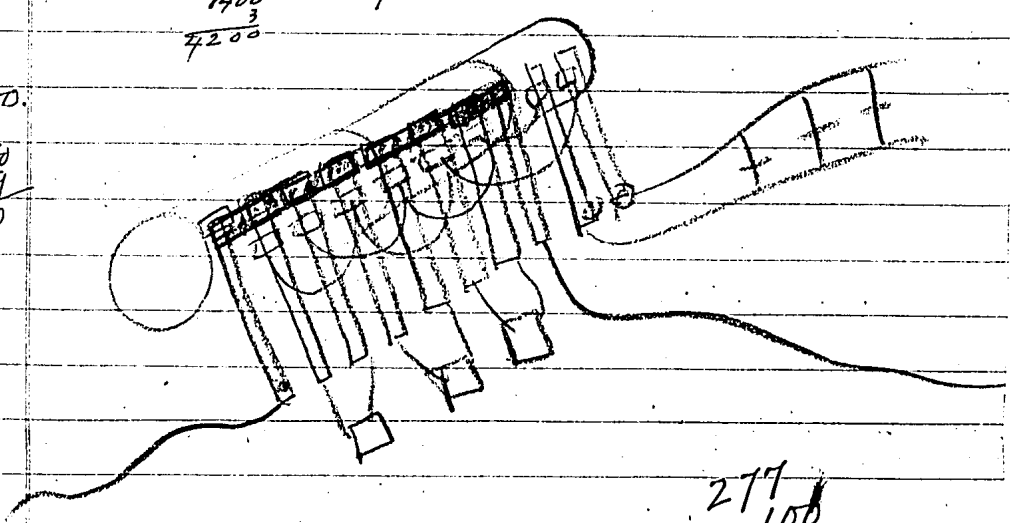
witness
Saml Sinnett
22nd June 1882

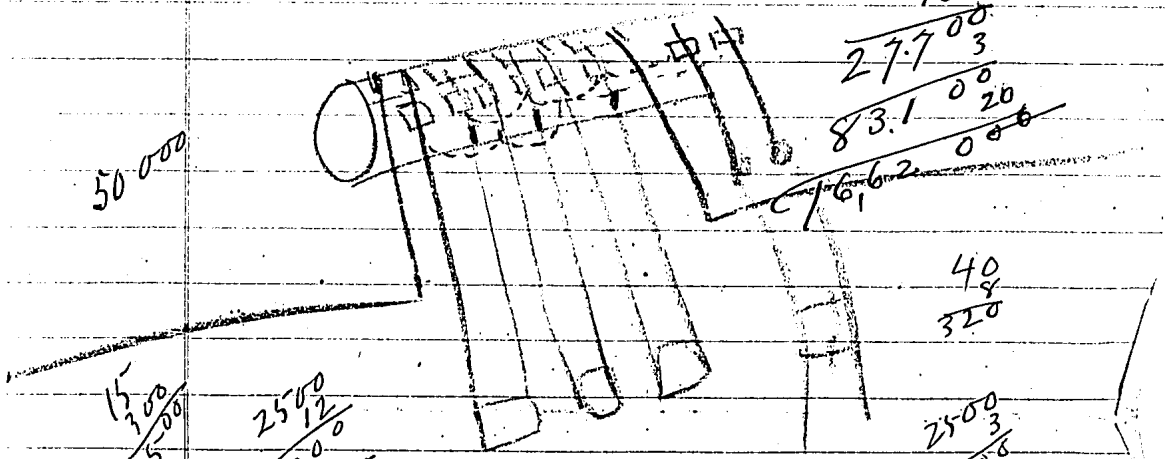


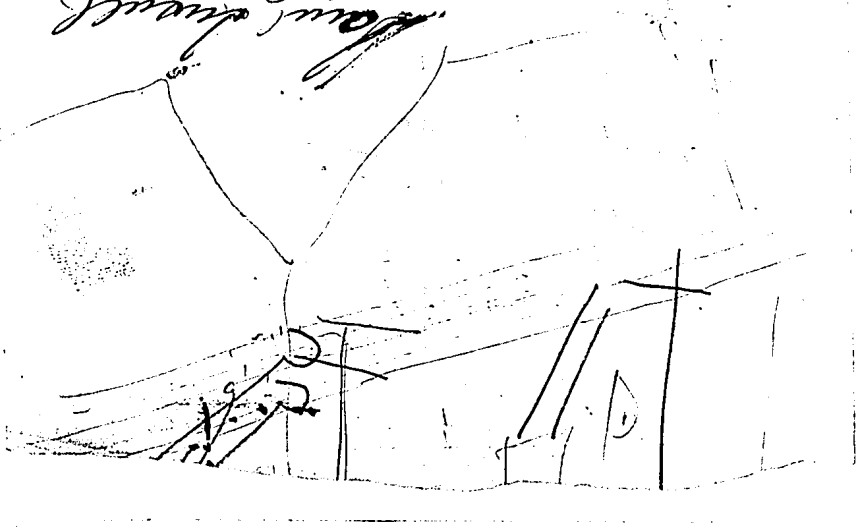


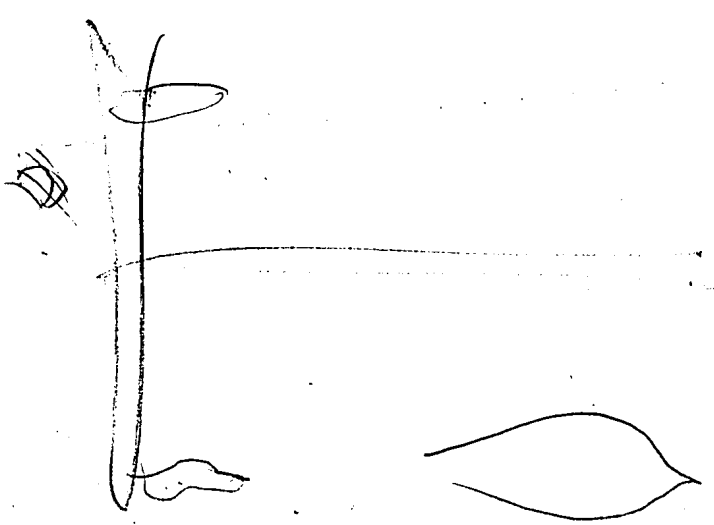
Eng

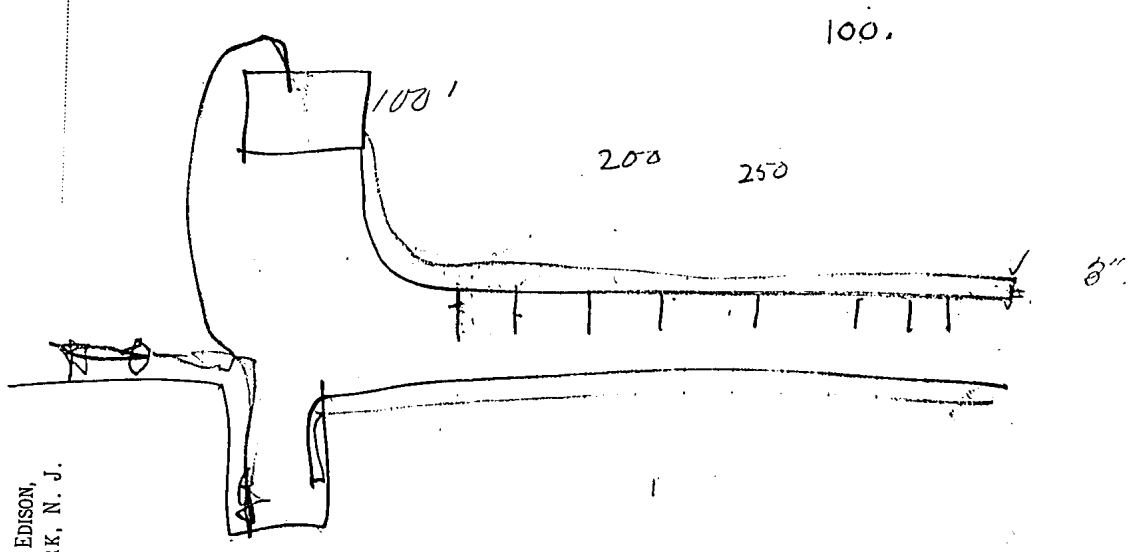
q net.



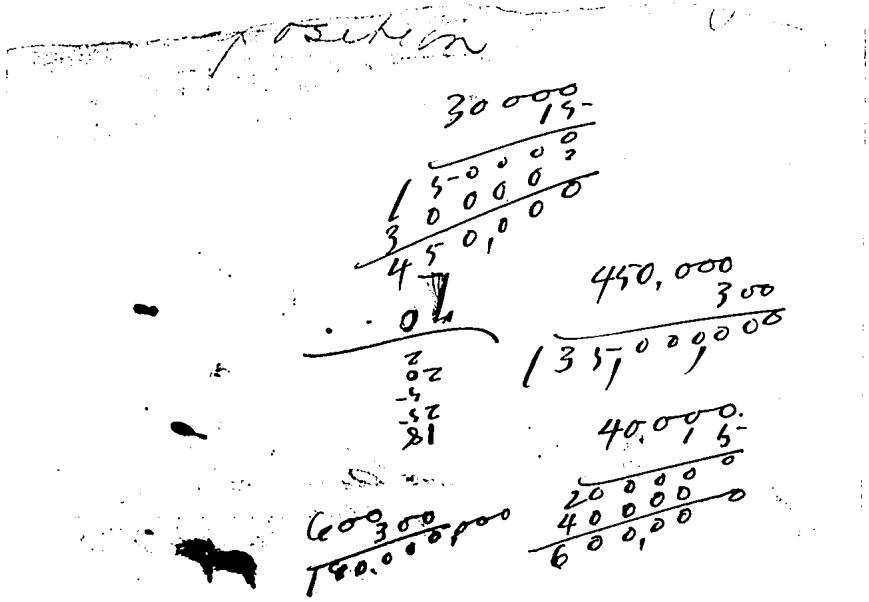


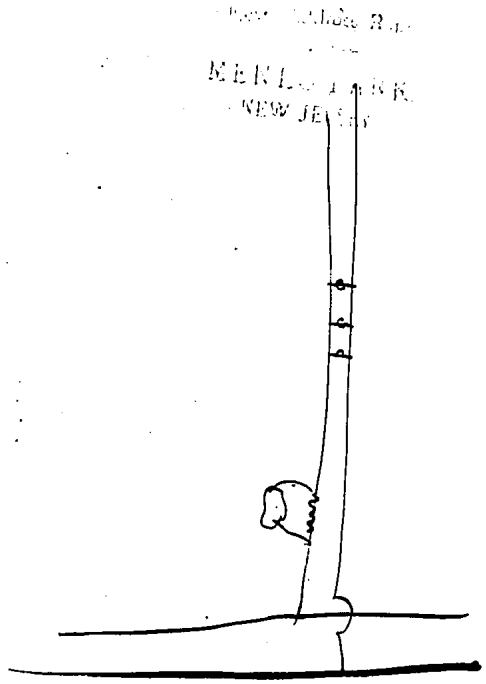


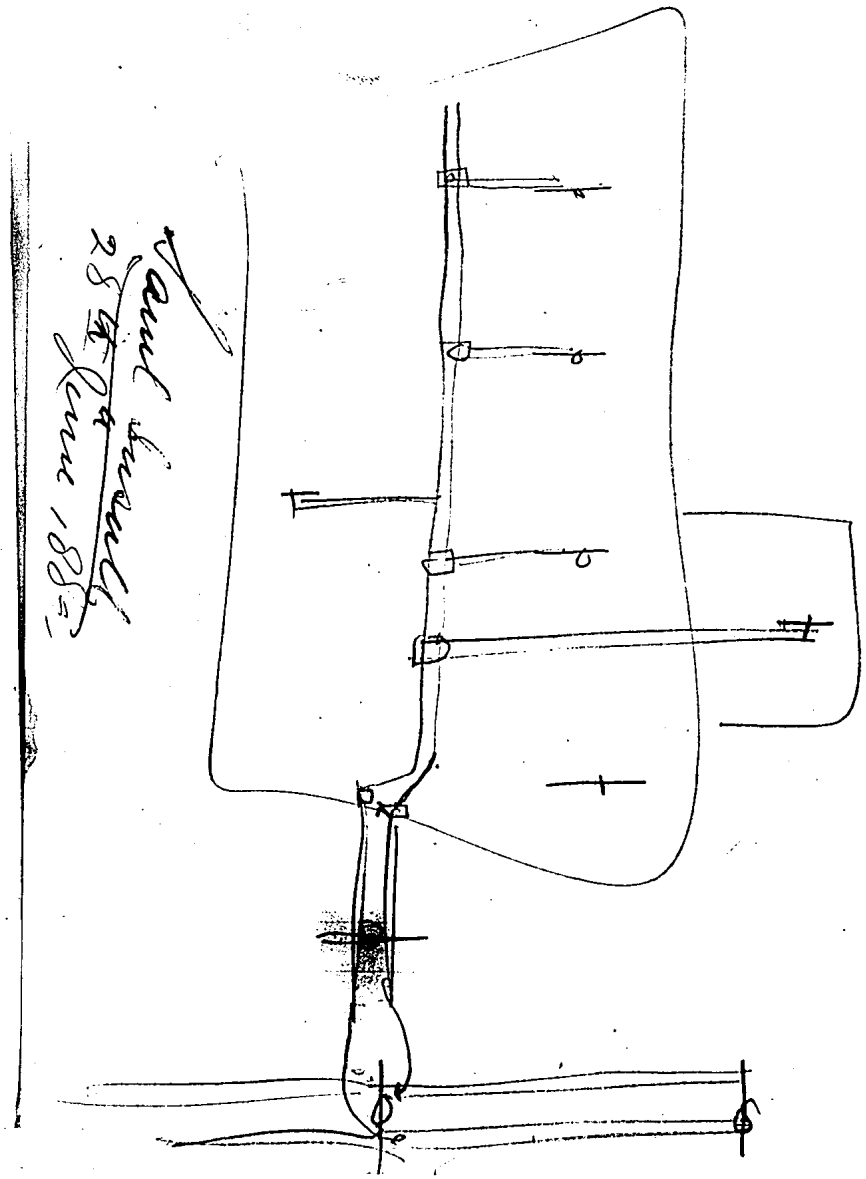





THOMAS A. EDISON,
MENLO PARK, N. J.







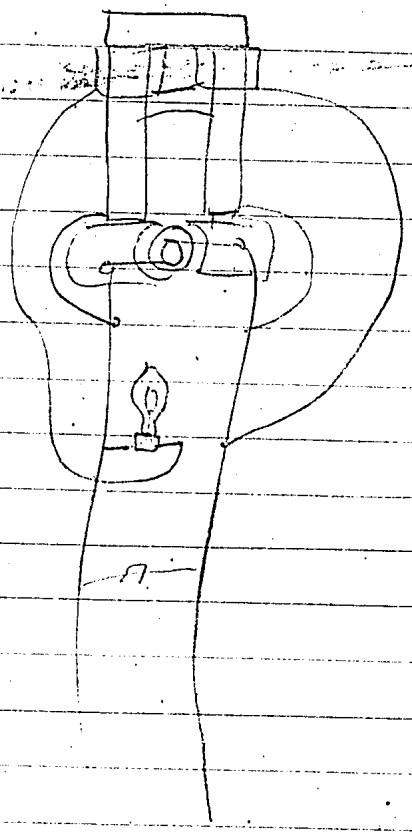
THOMAS A. EDISON,
MENLO PARK, N. J. ..... 188

15 Light 10 (?)
60 " " (?)
150 " 900
250 " 850

Mexico/Vera Cruz
Cuba
Spanish Coast
U.

2640 ft.

27 11 01 6 87 9 5



Saml Lucas
29th June, 1882

T. A. EDISON,

Menlo Park, N. J., ..... 1880.

Electrolysis of gases
Brodie
Proc Roy S XX 472.
Phil Mag (4) XLiv 470

10th Aug 82
T.A.E.

T. A. EDISON,

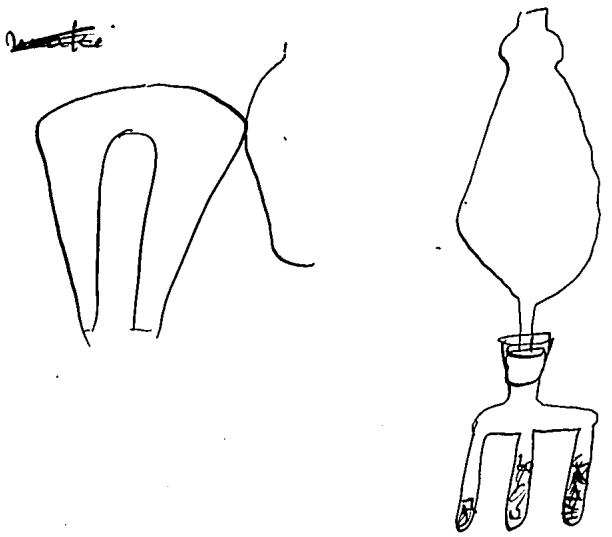
Menlo Park, N. J., ..... 1880.

Sal ammoniac & stacked lime,
a large excess of lime should be employed
1 part by weight of powdered Sal Ammoniac mixed with
2 parts by weight of Caustic Lime slaked to a
fine powder — mix well - put in Copper tube
jar and heat over Bunsen burner with gauze
interposed — drying tube should be
filled with small lumps of quicklime
(unslaked)

10th Aug 82
T.A.E.

T. A. EDISON,

Menlo Park, N. J., ..... *1880.*



$CO_2$ absorbed by heated potassium
176 Fahr
also heated Potassic Hydrate,
also absorbs $CO_2$
Phosphorus balls or K metal
for O Phos must be heated

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE, NEW YORK, 188

Mr Edison:

I have made the solution of ferrocyanide of iron, sulphate of iron and $SO_4$ in many different proportions and in each case the color changes to a whitish crystalline color under the heat.

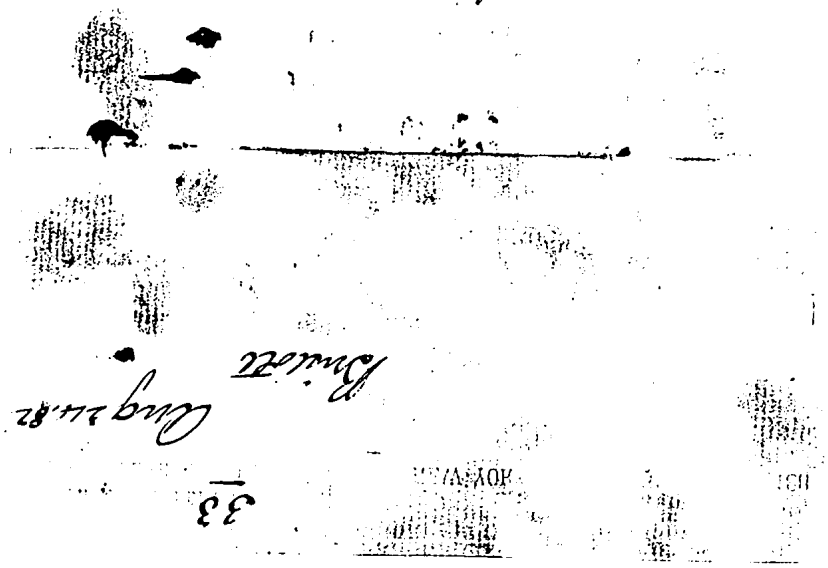
Then at a suggestion from Watts Dictionary, I dissolved ferrocyanide of iron in otalic acid. This solution saturated with ferrocyanide gives fair appearing result, but under the heat it changes to a reddish cinder-hue, as if destroyed.

Respectfully
Charles L. Bristol.

August 24.

Mr. T. A. Edison.

Present.

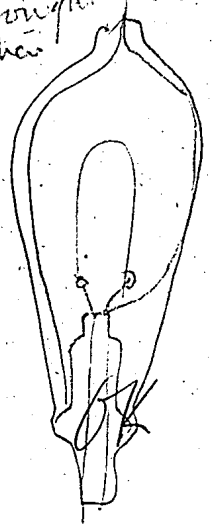


Pat 4 1 84 Glass

Solid glass.

Carbon spun and with pure Silica brought to incandescence while under vacuum. then glass melted -

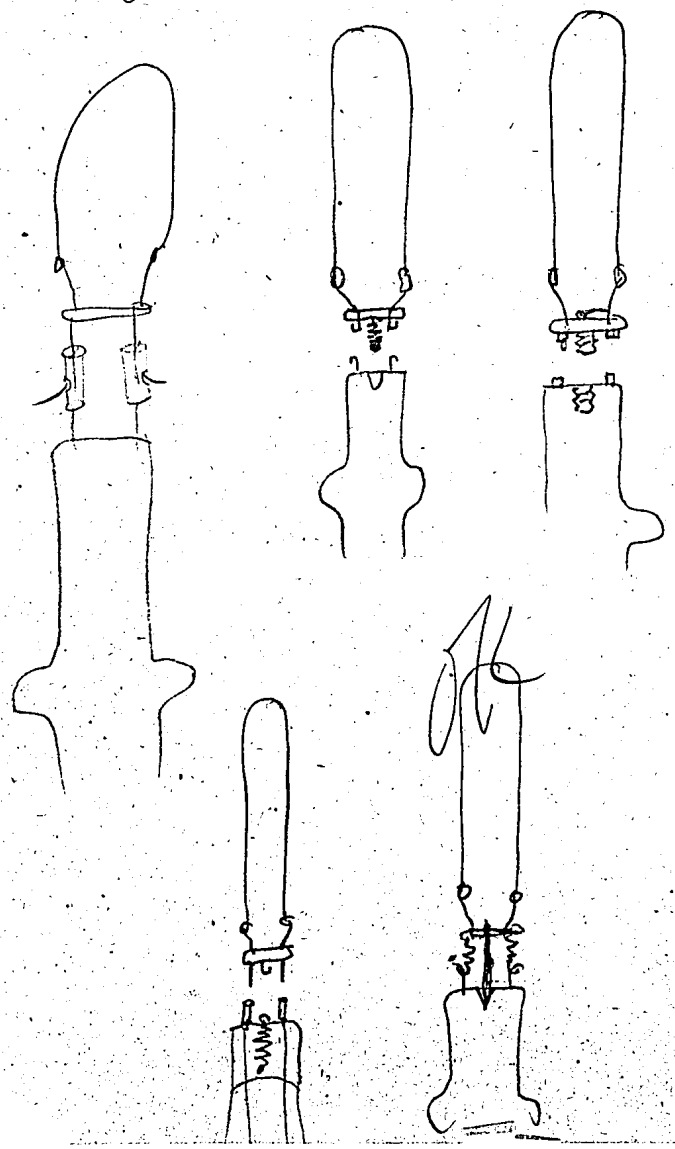
Wells process coat carbon with Zircon Silica, heat-ing etc take out & put in head & tube



inside coat to chg glass to ?

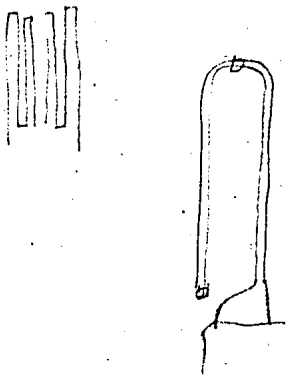
Treat paper by Hydrofluoric acid to ? element ?

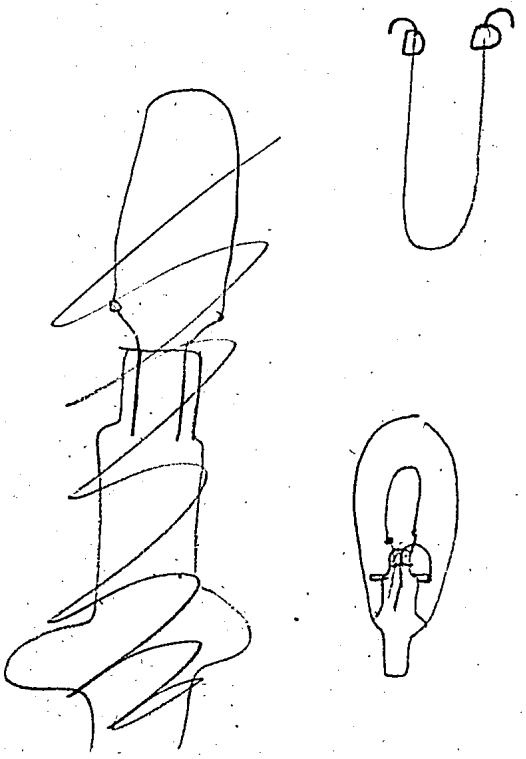
Pat 4 1 84 Glass



Mix Collodion with parchmentized jelly of Cellulose + see if it dont make a good Solid mixture

Carbonize Lampwick

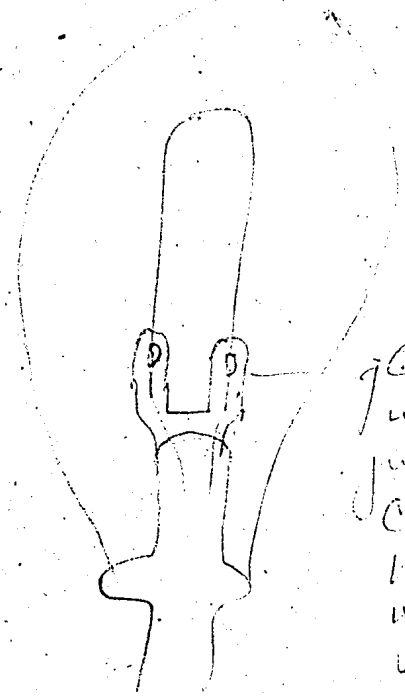




Try thread paper etc
in Hydrofluoric acid.
The acid will go away
itself & renders washing
unnecessary

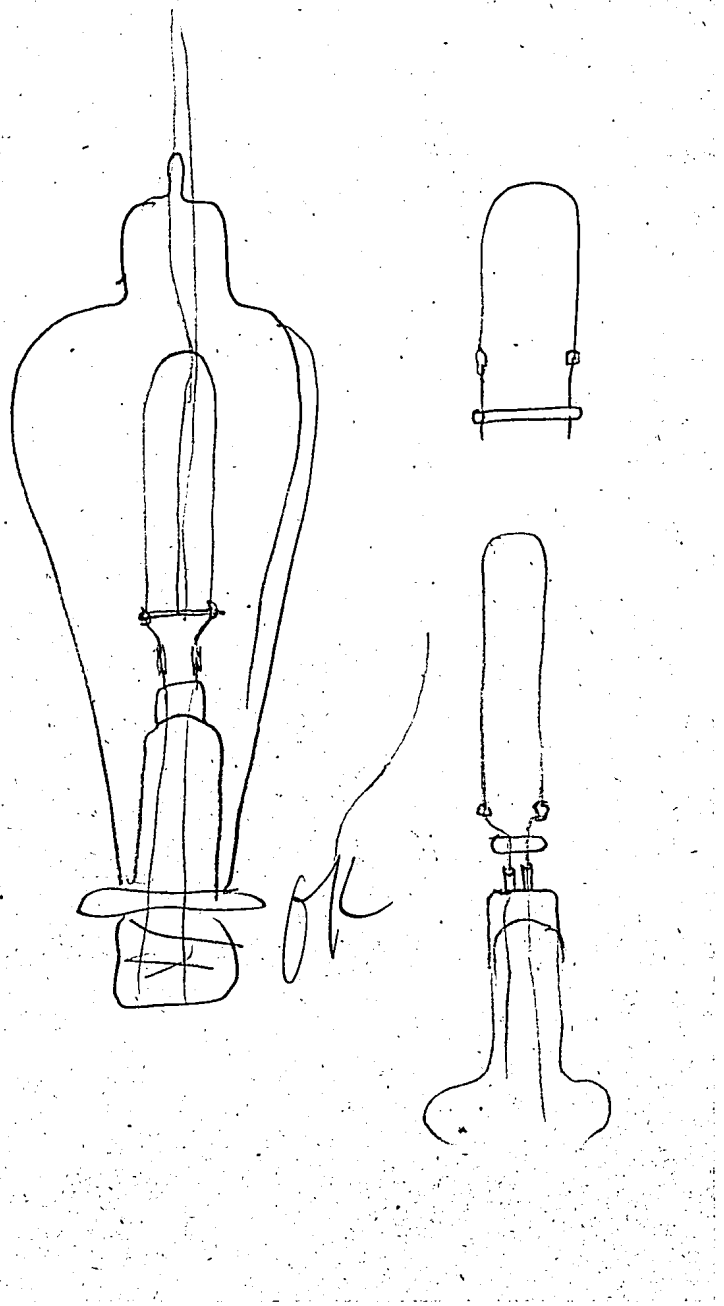
Try phosphoric acid for
platinum

Caveat



Glass tubes
with hole
just enough
Carbon to go
through but
will ptly seal
when Carbon
wtd in pump
& thus prevent
Charging

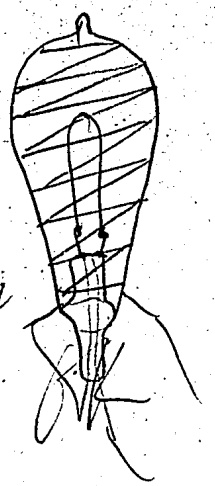
Patent two fibres in one globe that can be lighted seperately, then Exhaust & bring up both than if unable pass cyanogen or HCarbon gas or Chl Carbon prefbly cyanogen as it leaves no white & Equalize then then connect together in one socket so as to get 20 candles from both & Make 500 ohm

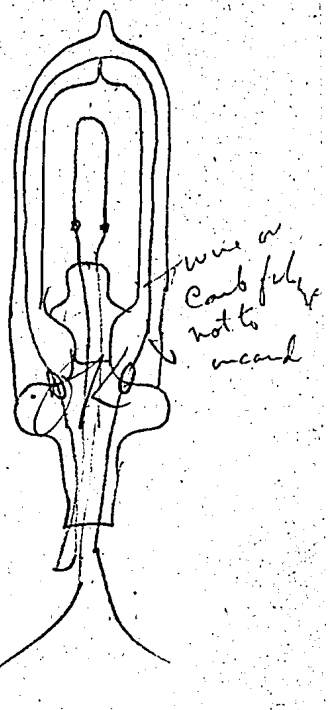


4-5

Patent

Oct 4 1882

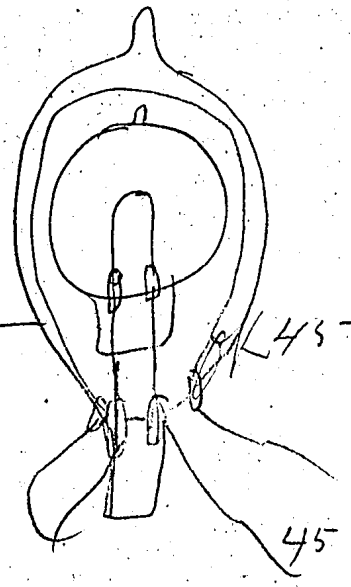





a Carb filament.
The wire that goes into
the orifice has a
greater surface than
the filament.

4-5

God




8. dia 13. long

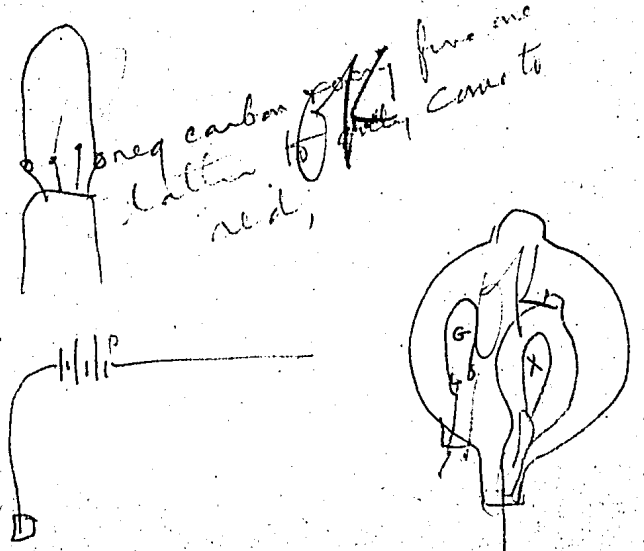
24
13
72
24
312

9 29 10

290..

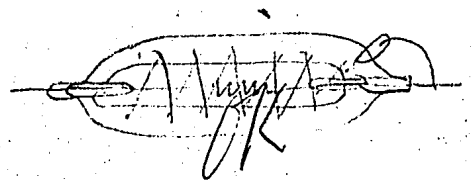
glass partition - see file before patent, —

Look at Spark gauge see if there is blackening of plate wire in glass where sealed



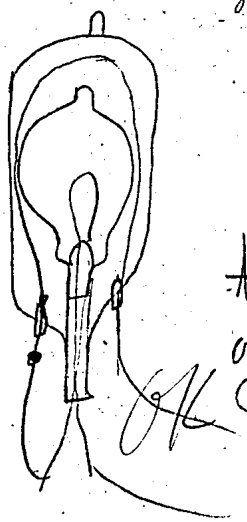

X req. lamp G ~~lamp~~ a filament
— after lamp to change
outside of X lamp panel
carrying —

A simple wire only
connected at end and
with Carborundum
surface + only connected
may do instead of
Cadmium wire with
Cement,



H
Size A

"Electric Lt.
—Drawings"



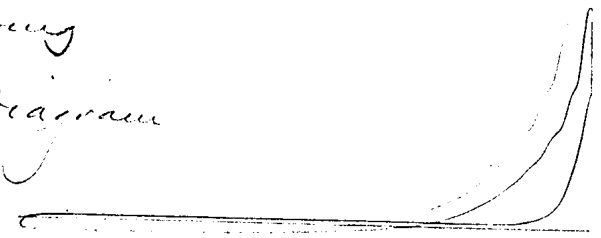
to change
outside a.
Copper wire
(brings use)
inside globe

Nov 11th 1887

| | | |
|---|---|---|
| Rev with Back end | 68 | 9 1/2 A.M. |
| Steam | 70 | |
| Rev with Back in | 66 | Back end. |
| Steam | 70 | |

Hold steering

Double Diagram



Nov 11th 1887

| | | |
|---|---|---|
| Rev with Back end | 68 | 9 1/2 A.M. |
| Steam | 70 | |
| Rev with Back in | 65 | Back end |
| Steam | 70 | |

Hold steering.

Double Diagram

Nov 11th 1887

| | | |
|---|---|---|
| Rev with Back end | 68 | 9 1/2 A.M. |
| Steam | 70 | |
| Rev with Back in | 66 | |
| Steam | 70 | |

Head end.

Hold steering.

Double Diagram

Nov 11 1882 — 9 23/60 A.M.

Rev with Vacuum 68
Steam 70
Rev with Vacuum 65
Steam 70

Front end.

Holt Fleming

Double Diagram

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Nov 11 1882 — 9 45/60 A.M.

Engine & Pump testing in Machine Shop.

Rev 70
Steam 70

Front end.

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Nov 11 1882 — 9 50/60 A.M.

Engine & Pump testing in Machine Shop 78.

Rev 70
Steam 70

Back end

May 11th 1882

10,45 a.m.
Steam 70
Car 64

Engine & Car

Going down grade

500 ft from Dale

Engine & Car

10,47 a.m.
Steam 70
Car 68

2d Train down grade

5000 ft from Dale

Engine & Car

10,49 a.m.
Steam 70
Car 64

Going up grade

7000 ft from Dale

10 57 am
Atem 70
Rm 67

Engine No 1

Circuit Broken
Engine at Noes Creek.

10 53 am
Atem 70
Rm 68

Engine No 1

Noes Creek going down grade
6900 ft from Cache

10 55 am
Atem 70
Rm 64

Engine No 1

Pelek Creek coming up grade
4000 ft from Cache

10 57 a.m.
Atm 70
Rain 68

Engine Car

500 Feet away coming at a rate

10 59 a.m.
Atm 70
Rain 68

Circuit Broken

11:1 a.m.
Atm 70
Rain 70.

Circuit Broken

11'3 Gin
Return 72
Steam 68

Circuit Trotter

11'5 Gin
Return 74
Steam 70

Circuit Trotter

Model 1882
Rev with Incr cut 67
Steam 70
Rev " " in 66
Steam 70
Hobbs Spring.

Double diagram

Back end
8 38/100 A.M.

201

Nov 11th 1882

Reynolds Tract mark 67
Steam " 70
Reynolds Tract in " 66
Steam " 70

Frost Land
8 55 a.m.

Holbs spring

Sketch diagram

No 2

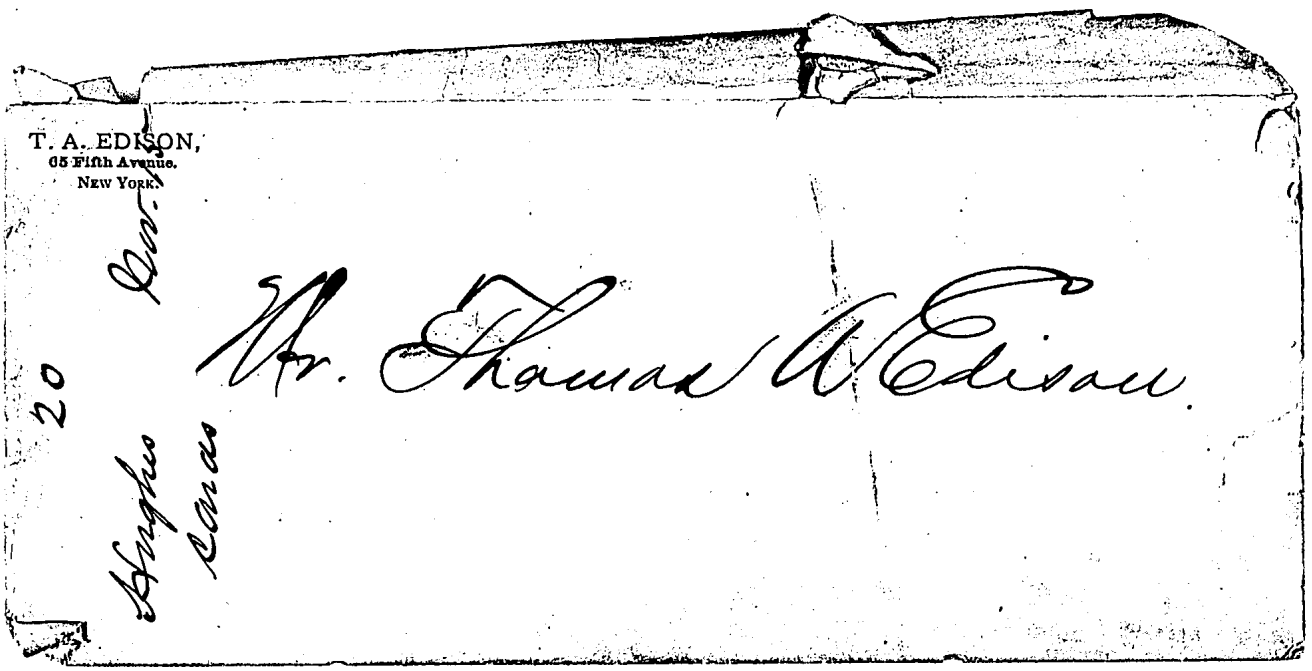
Tract mark No 1 '66 Rey
" " No 2 67 "
Tract " No 3 64 "
" Mark " " 4 66 "

Steam 70
" 76
5.20 pm Steam 70
5.25 " " " "

Frost Land

Holbs spring

No 3



T. A. EDISON,
65 Fifth Avenue,
New York.

Mr. Thomas A. Edison.

20 Bro.

Brighton Beach

H V Cable d J 7 People
H 6 1st Car. d J
H 7 2d Car. d J
H 8 Tender d J
H 9 Hose Truck d J
H 10 Pumpstown Forward Bogie

H 51 Standing d J Pumpstown
H 52 Bogie d J
H 53 Hose Car d J
H 54 Tender d J
H V Mc d J
H 56 1st Car d J
H 57 Cable d J C.B.

~~Total~~ distance 2 Miles. within few feet more or less.

7 people on Car
2 on Loco —
pasgr Loco & Car —

20

Cards Pass
Coco & Pan
Car

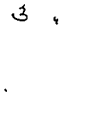
1st 2d 3d

Rev 78-77-77

7/0 20th/1882

#1 Av. Press 6.4 H.P 17.28 — 1st Friction
#2 " " 8.4 H.P 26.88 — 2d Field — Front end
3 " " 9.5 H.P 30.40 — 3d Back — 30 lb spring

10.40 a M




4.1

1st 2d 3d

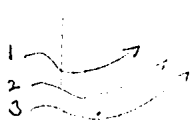
Rev 78 77 77

Steam 50.

#1 Av. Press 6# H.P 17.92
#2 " " 7.8 H.P 24.96
3 " " 10. H.P 32.

7/0 20th/1882

1st Friction — Back end
2d Field on — 3d back spring
3d Back "




10 40 a M

Constant = .0021166 which multiplied by steam press on revs. = H.P.

4.2

1st 2d 3d

Rev 80 79 79

Steam 51

7/0 20th/1882

Back end

10 45 a M

30 lb spring

#1 Av. Press 6.7# H.P 19.15
#2 " " "
3 " " "

4.3

Area = .8

$\neq 1 = .78$
$^2 = 1.1$
$^3 = 1.41$

1 Area .74
2 Area 1.15
3 Area 1.3

1st = 1 3
Rev 80 79 79
Steam V-1

Nov 20 1882

1st Friction
2d Field in
3d Back on

Front end
Bolt Spring

10 HP A.M.

| | A.P. | N.P. |
|---|---|---|
| #1 Cyl. | 5. | 16.80 |
| #2 Cyl. | 2.9 | 26.07 |
| #3 Cyl. | 8.6 | 28.38 |

1
2
3

4.17

1st = 1 3
Rev 78 77 77

1st Friction
2d Field on
3d Back on

Nov 20 1882

Back end
Bolt Spring

10,50 A.M.

| | A.P. | N.P. |
|---|---|---|
| #1 Cyl. | | |
| #2 Cyl. | | |
| #3 Cyl. | | |

4.7

1st = 1 3
Rev 78 77 77

#1 A.P. 5.85 N.P. 19.12
#2 A.P. 8.76 N.P. 28.29
#3 A.P. 9.51 N.P. 30.71

1st Friction
2d Field
3 Back

Nov 20 1882

Front end
Bolt Spring

10.50 A.M.

1
2
3

4.1

1 Area = .8
2 = 1.2
3 = 1.8

1 Area = .7
2 = 1.1
3 = 1.2

Front End
Freight Engine 3 loaded cars
18 Tons

11,10 Tons
30 lb Springs
Item 52

Run 74

At cable down grade
Av. Press 18.# N.P. 55.8

Back end
Freight Engine 3 loaded Cars
18 Tons.

11,10 Tons
30 lb Springs
Item 52

74

At cable down grade
Av. Press 41.22 N.P. 3478

V.117

Front end
Freight Engine & 3 loaded cars
18 Tons.

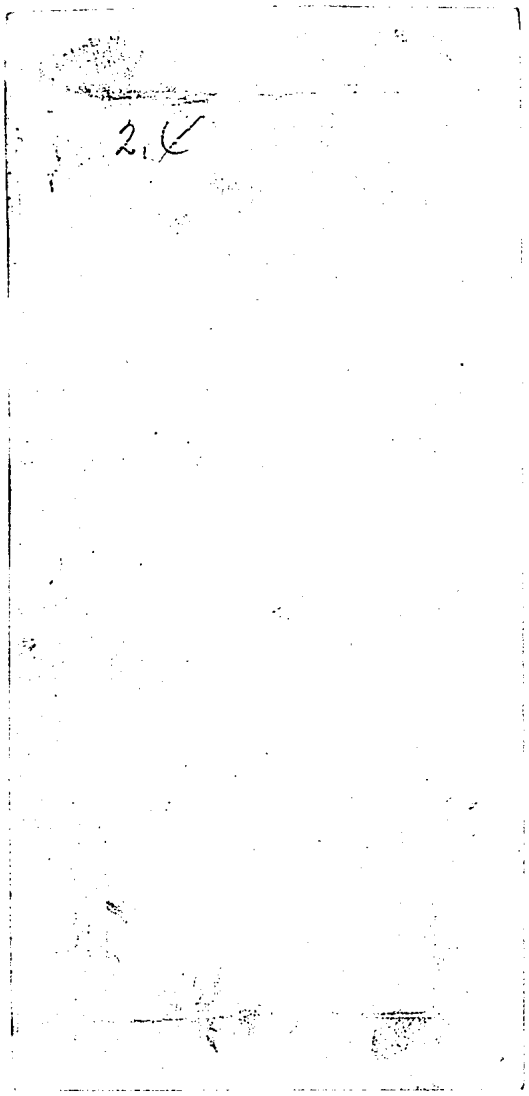
11 13 Tons
30 lb Springs
Item 56

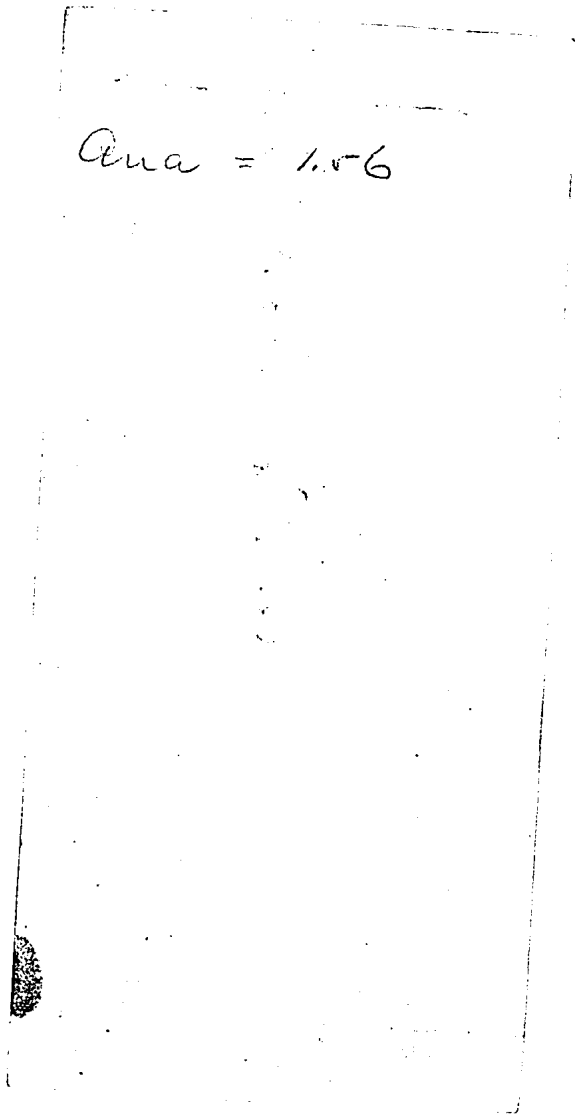
Run 76

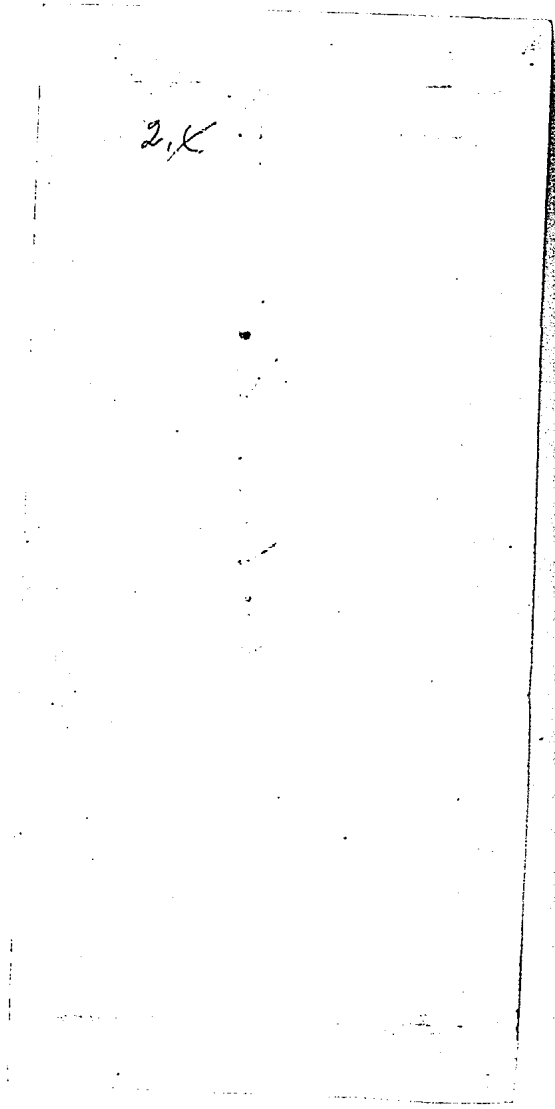
Av. Press 17.37 N.P. 55.41

V.116

700 ft away from Cable down grade


2,K


Qma = 1.56


2,K

Back end
Freight Engine & 3 loaded cars
18 Tons

11/13 Am
30 lb spring
Mean 57

Lin 76
Av. Press 19.62 M.P. 62.58

4.17
4700 ft away from Cable down grade

Front end
Freight Engine & 3 loaded cars
18 Tons.

11/15
30 lb spring
Mean 59

76
Av. Press 18.06 M.P 57.61

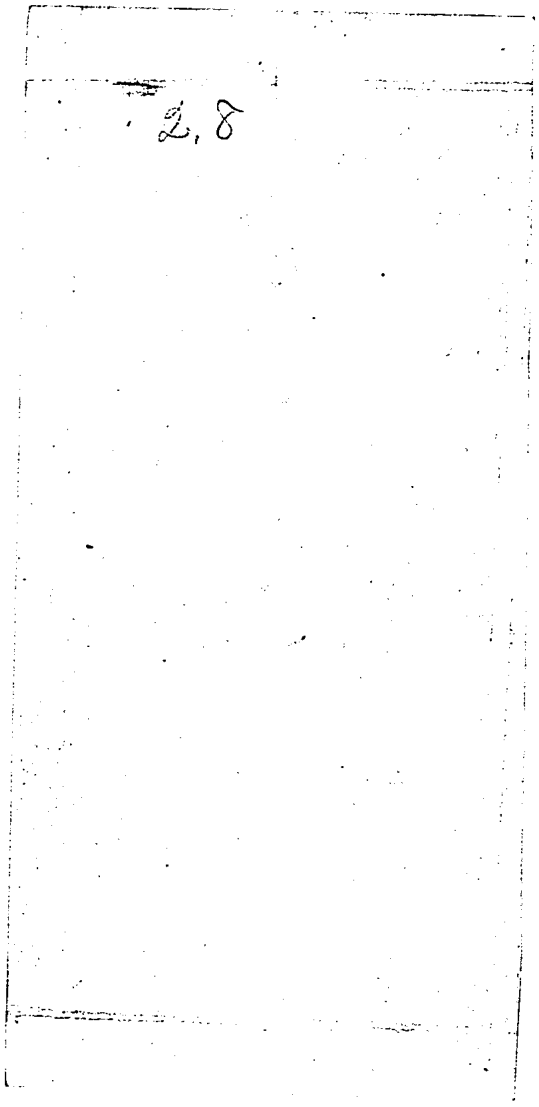
4.15
1700 ft away from Cable down grade

Back end
Freight Engine & 3 loaded cars
18 Tons.

11/15 Am
30 lb spring
Mean 60

Lin 76
Av. Press 20.07 M.P. 64.02

4.18
1700 ft away from Cable down grade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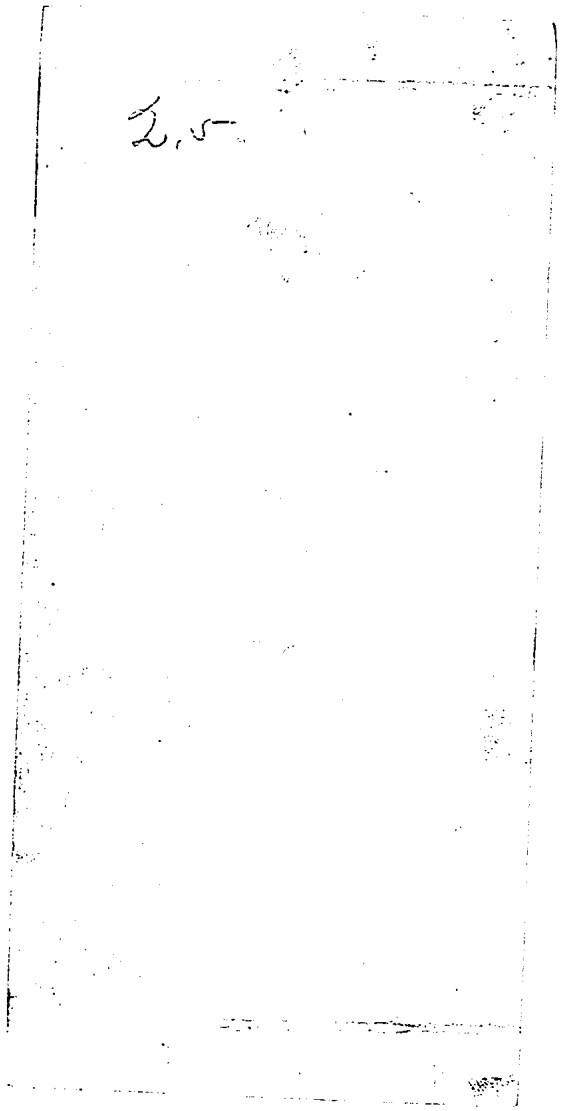
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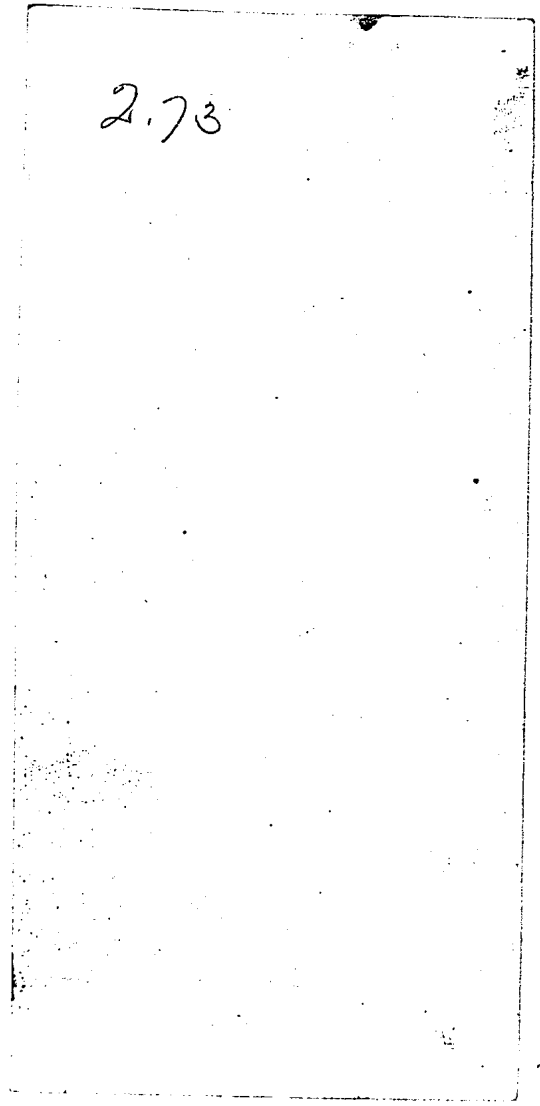

2,73

Front End
Freight Engine & Loaded cars
180 Tons.

11/16 Cam
Bolt & Spring
Steam 50
Run 94

Av. Press 16.77 M.P. 51.98

4.11
4700 ft away from Cable down grade

Back end
Freight Engine & Loaded cars
180 Tons.

11/16 Cam
Bolt & Spring
Steam 50
Run 94

Av. Press 17.91 M.P. 55.61

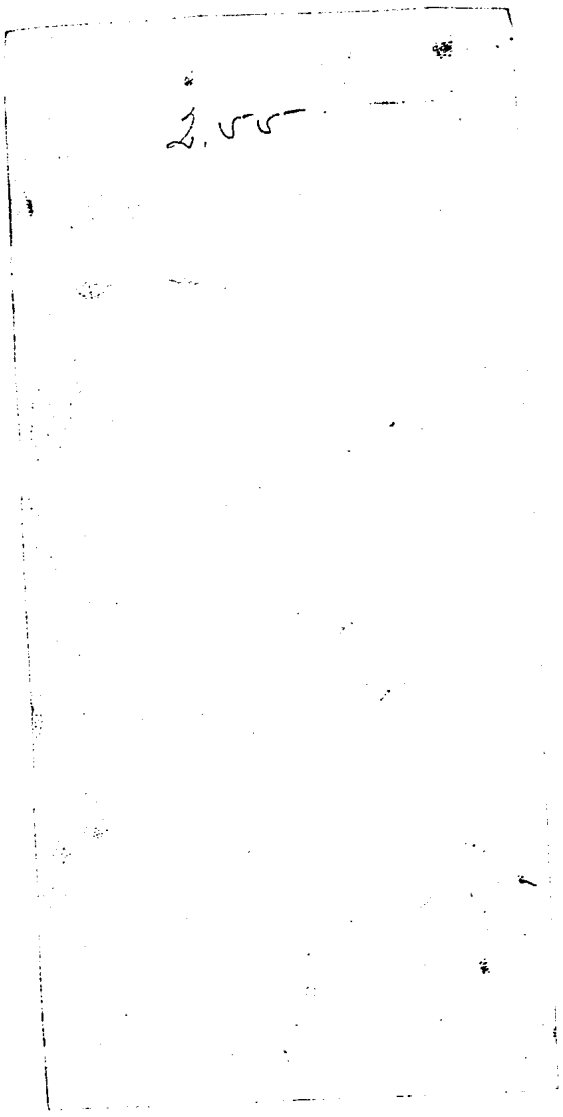
4.13
4700 ft away from Cable down grade

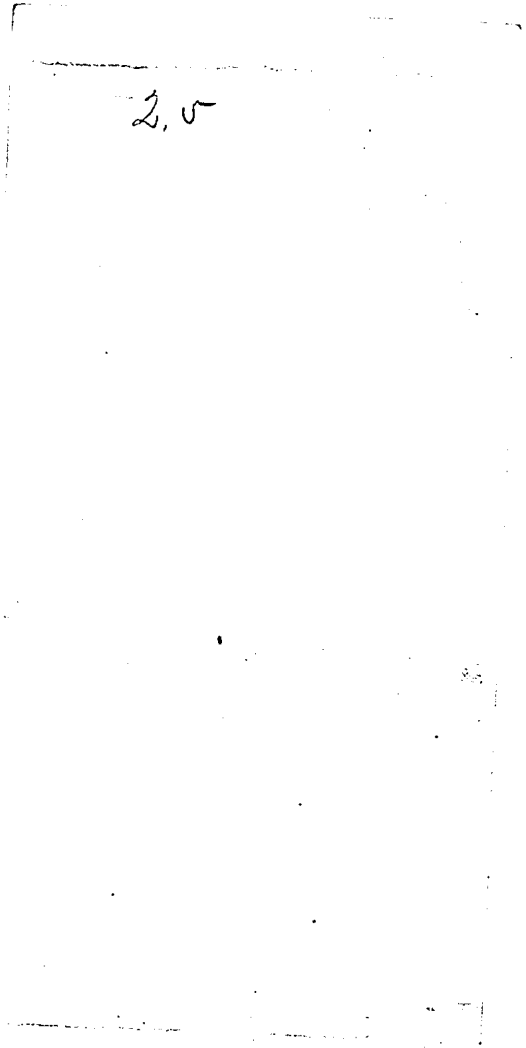
Front End
Freight Engine & Loaded cars
180 Tons.

11/16 Cam
Bolt & Spring
Steam 49
Run 96

Av. Press 18.3# M.P. 58.37

4.18
4800 ft away from Cable up grade


2.55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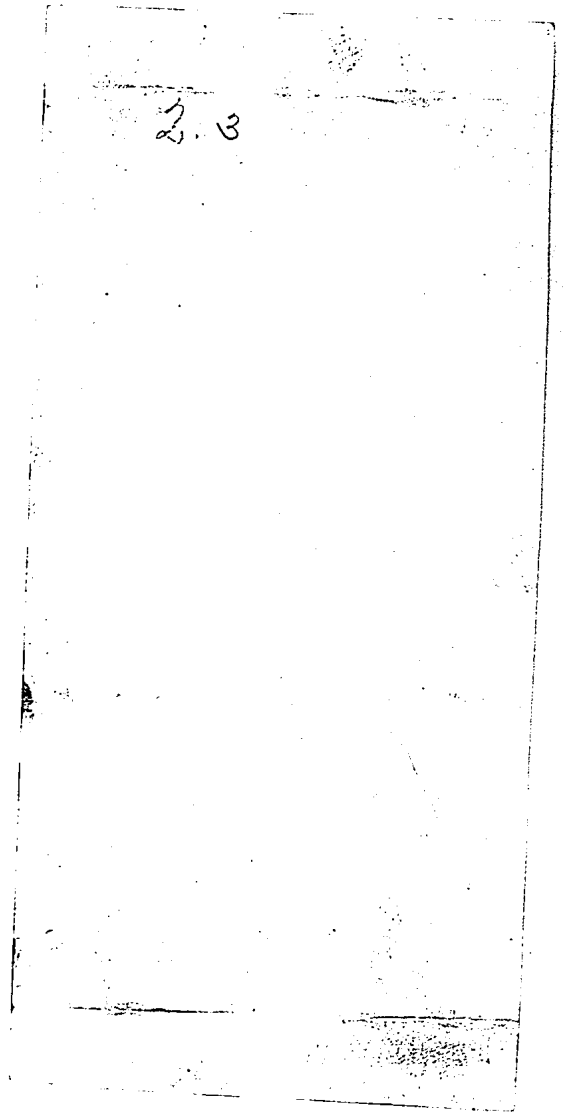
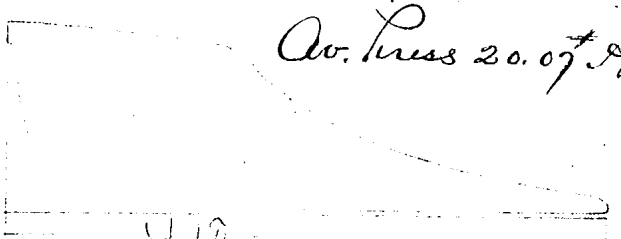

2.6

Back end
Freight Engine & Loaded Cars
18 Tons.

11:18 a.m.
Boiler pressure
Steam 45
Rev 76

Av. Press 20.0 # A.T. 64.02

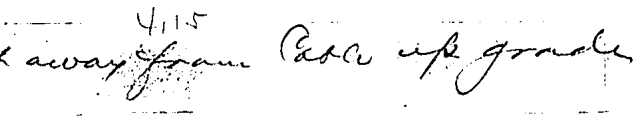



4800 ft away from Cable up grade

Front end
Freight Engine & Loaded cars
18 Tons.

11:20 a.m.
Boiler pressure
Steam 45
Rev 74

Av. Press 18.42 # A.T. 57.10

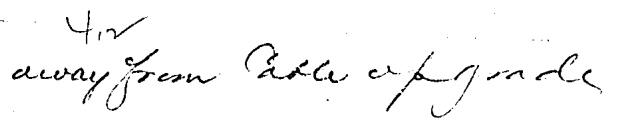



5700 ft away from Cable up grade

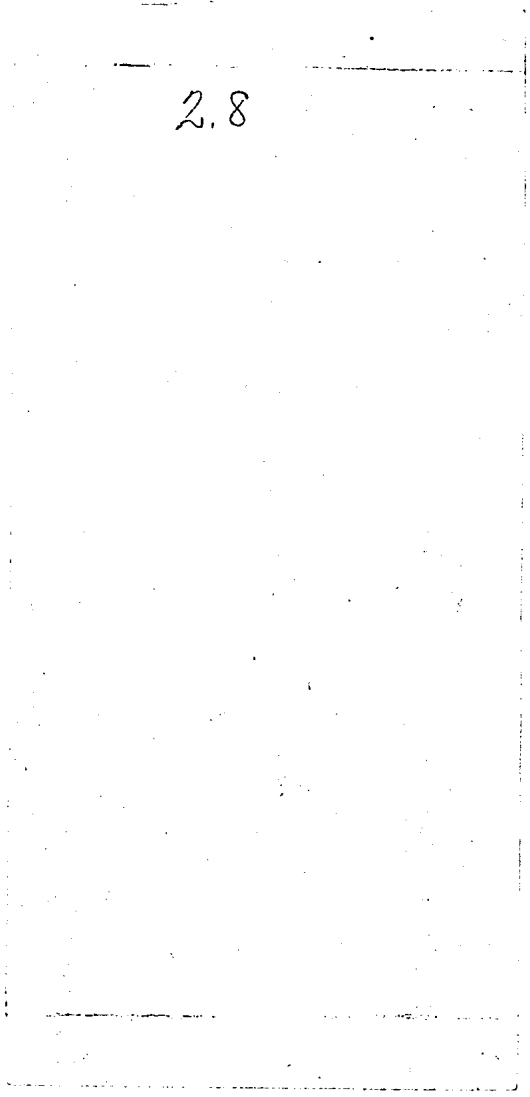
Back end
Freight Engine & Loaded cars
18 Tons.

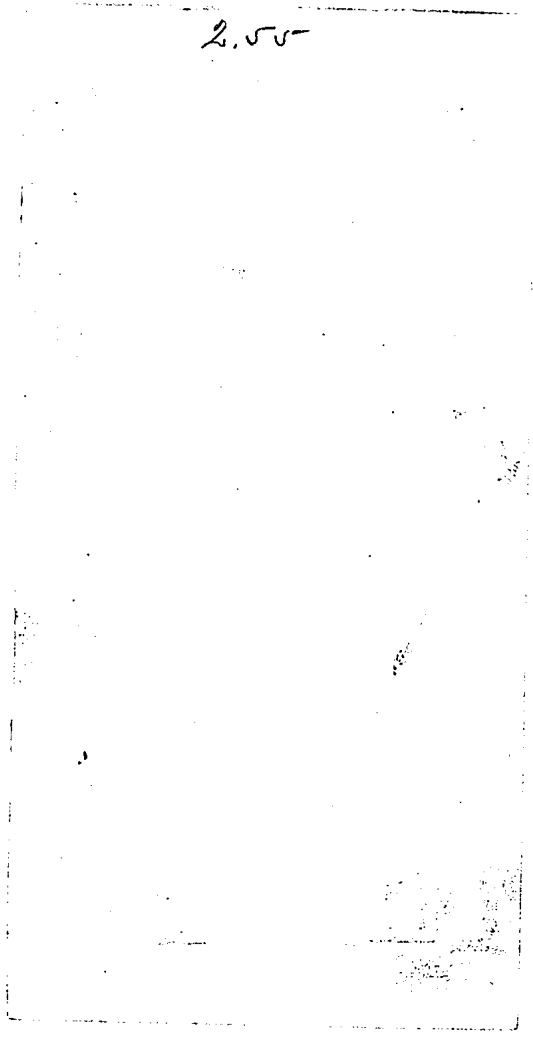
11:20 a.m.
Boiler pressure
Steam 45
Rev 74

Av. Press 19.98 A.T. 61.93




5700 ft away from Cable up grade


2.8


2.55


2.8

Front end
Freight Engine & 3 loaded Cars
18 Tons.

11:22 AM
30 lbs sand
Rev 74

Av. Press 18.78# N.P. 58.21

4.15
6100 ft away from Cadle upgrade

Back end
Freight Engine & 3 loaded Cars
18 Tons.

11:22 AM
30 lbs sand
Rev 74

Av. Press 20.01# N.P. 62.03

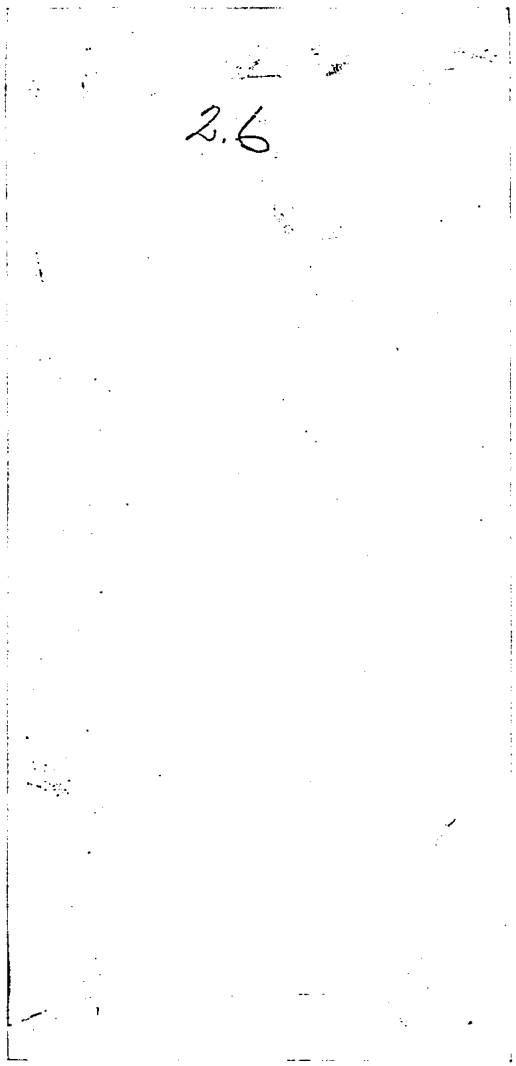
4.15
6100 ft away from Cadle upgrade

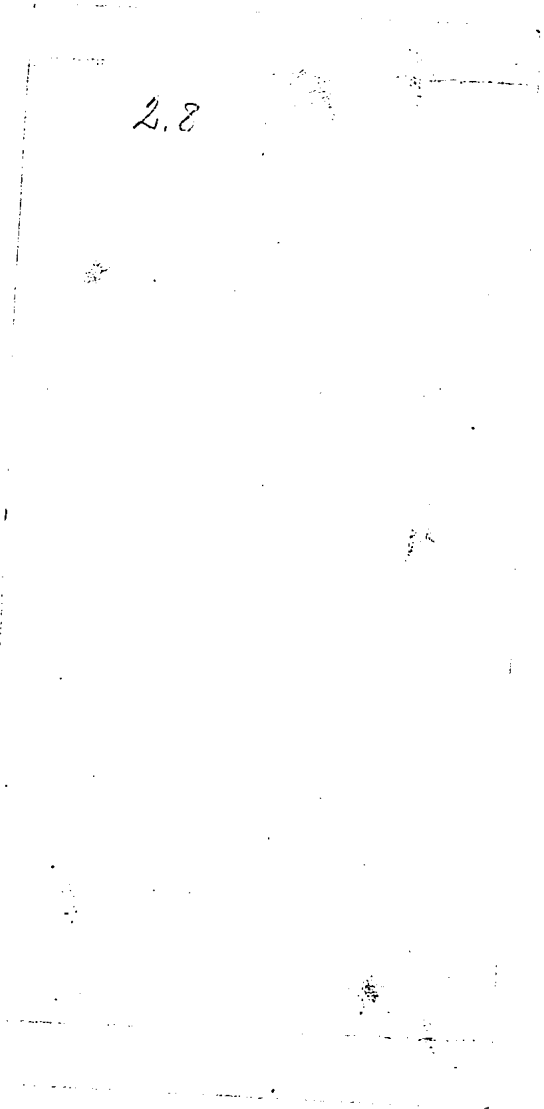
Front end
Freight Engine & 3 loaded Cars
18 Tons.

11:24 AM
30 lbs sand
Rev 76

Av. Press 18.78# N.P. 59.9

4.15
6500 ft away from Cadle upgrade


2.6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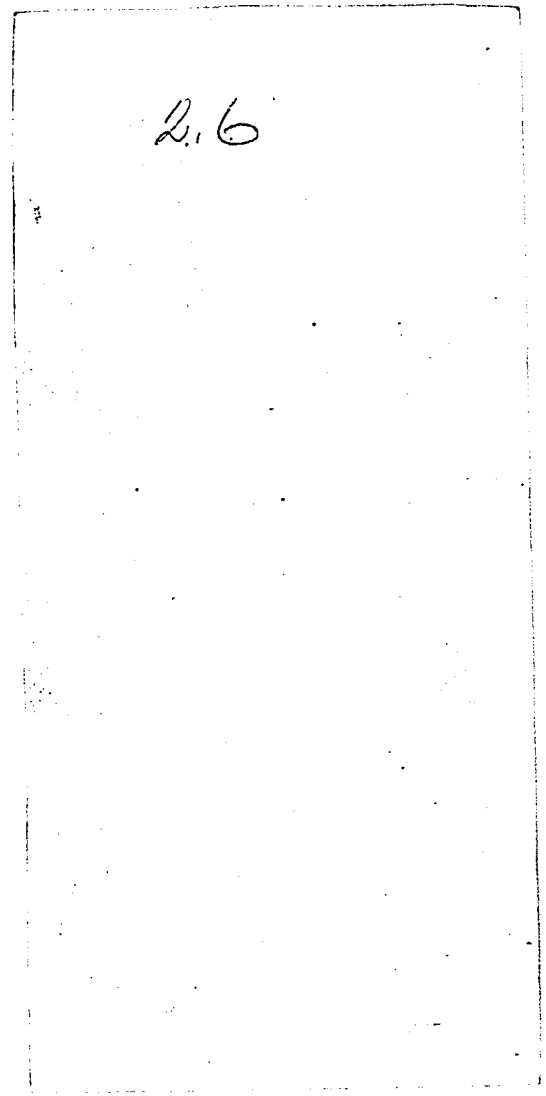

2.6

Back end
Freight Engine & 3 loaded Cars
18 Tons

11 2 4 Axle
30 lb spring
Arm 50
Arm 76

Av. Press 19.35 A.T. 61.72

6500 Ft away 4.18 from Cable up grade

Front end
Freight Engine & 3 loaded Cars
18 Tons.

11 2 6 Axle
30 lb spring
Arm 50
Arm 74

Av. Press 18.33 A.T. 56.73

6700 Ft away 4.18 from Cable down grade

Back end
Freight Engine & 3 loaded Cars
18 Tons

11 2 6 Axle
30 lb spring
Arm 50
Arm 74

Av. Press 19.59 A.T. 60.72

4.18
6700 Ft away from Cable down grade

2.78

2.57

2.7

Front end
Freight Engine V 8 loaded Cars
18 Tons

11.29 a/m
3 Volt Springs
Max. 5-0
Ave. 74

Av. Press 18.06. A.T. 56.98

7300 ft away 4.15 from Cable, down grade

Back end
Freight Engine V 8 loaded Cars
18 Tons

11.27 a/m
3 Volt Springs
Max. 5-4
Ave. 77

Av. Press 18.27 A.T. 56.63

7300 ft away 3 from Cable down grade

Front end
Freight Engine V 8 loaded Cars
18 Tons.

11.30 a/m
3 Volt Springs
Max. 5-0
Ave. 78

Av. Press 17.94. A.T. 58.66

8500 ft away 4.18 from Cable down grade

2.5

2.5

2.5

Back end
Freight Engine & Loaded Cars
18 Tons.
Av. Press 18.9 A.P. 61.80

8500 ft away from Cable drawing grade
4.18

Front end
Freight Engine & Loaded Cars
18 Tons.
Av. Press 17.07 A.P. 55.81

9300 ft away from Cable drawing grade
4.13

Back end
Freight Engine & Loaded Cars
18 Tons
Av. Press 17.X A.P. 56.89

9300 ft away from Cable drawing grade
4.17

2.45

2.35

2.6

Front end
Freight Engine & Loaded Car
18 Tons

11:33 A.M.
30 lb spring
Run 76
Av. Press 19.5 M.P. 62.20

930 ft away coming up grade

Back end
Freight Engine & Loaded Car
18 Tons.

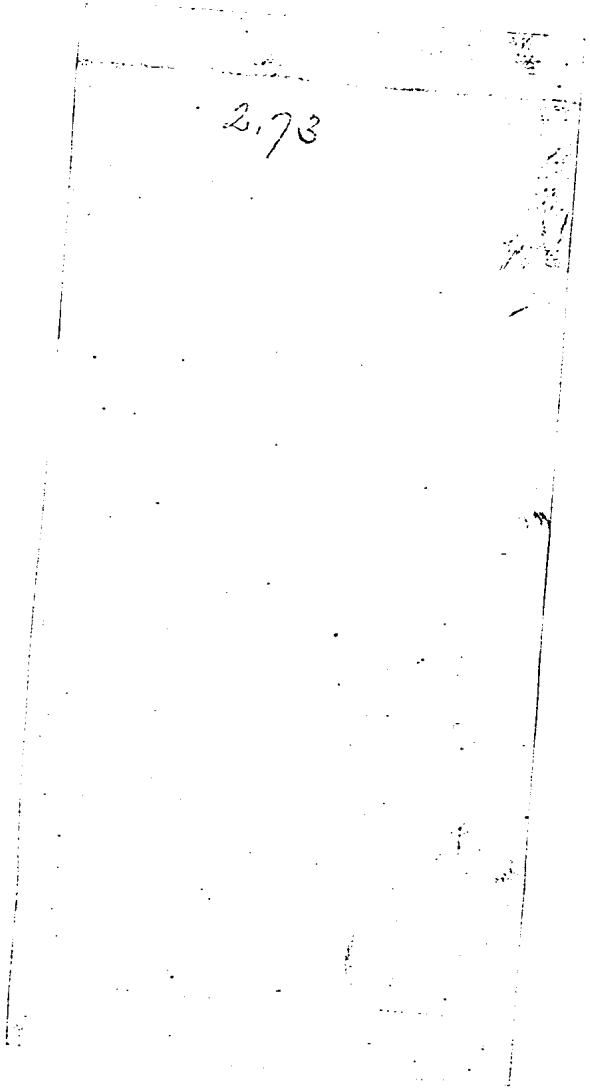
11:33 A.M.
30 lb spring
Run 76
Av. Press 19.7 M.P. 62.84

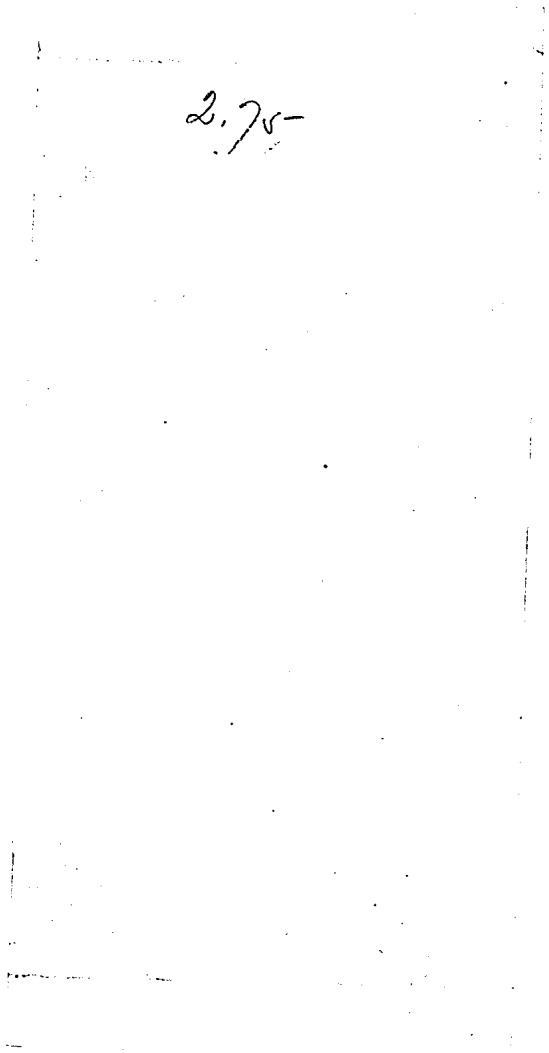
930 ft away from Cadiz coming up grade

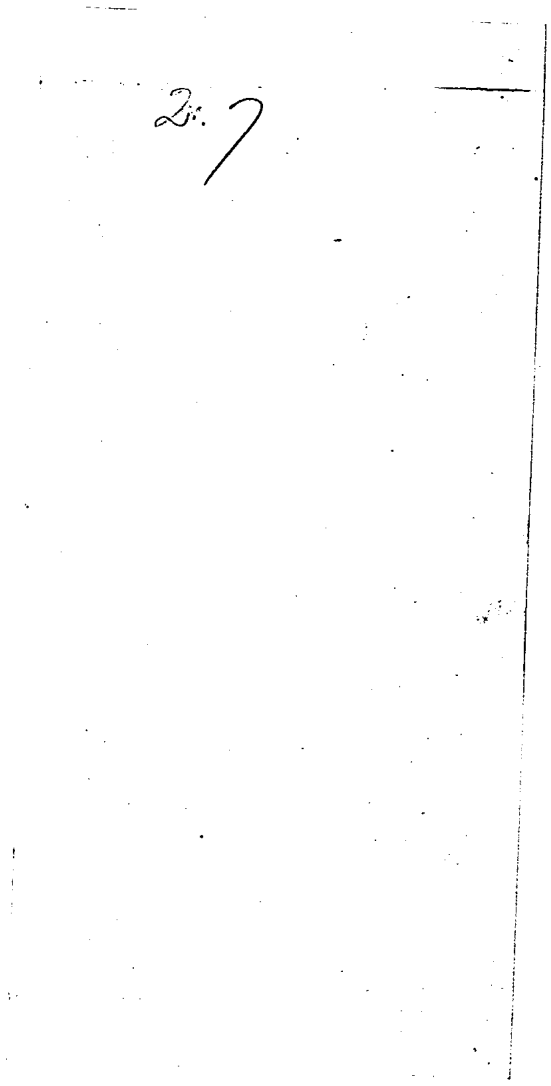
Front end
Freight Engine & Loaded Car
18 Tons.

11:35 A.M.
30 lb spring
Av. Press 19.5 M.P. 61.42

9100 ft away from Cadiz coming up grade


2.73

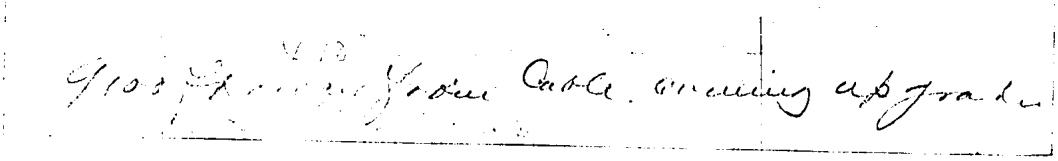

2.75


2.7

Back end
Freight Engine 7 Boarded Cars
18 Tons.

11.35 A.M.
Bolt Spring
Main 50
Rec 75

Av. Press 20.07 M.P. 63.22



Back end
Freight Engine 7 Boarded Cars
18 Tons

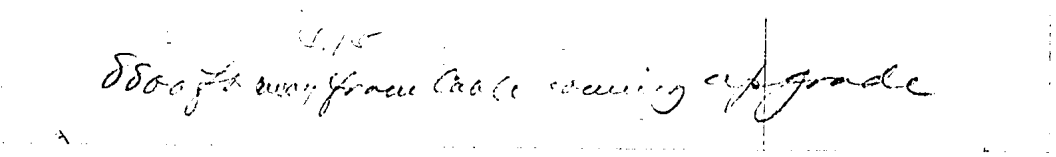
Bolt Spring

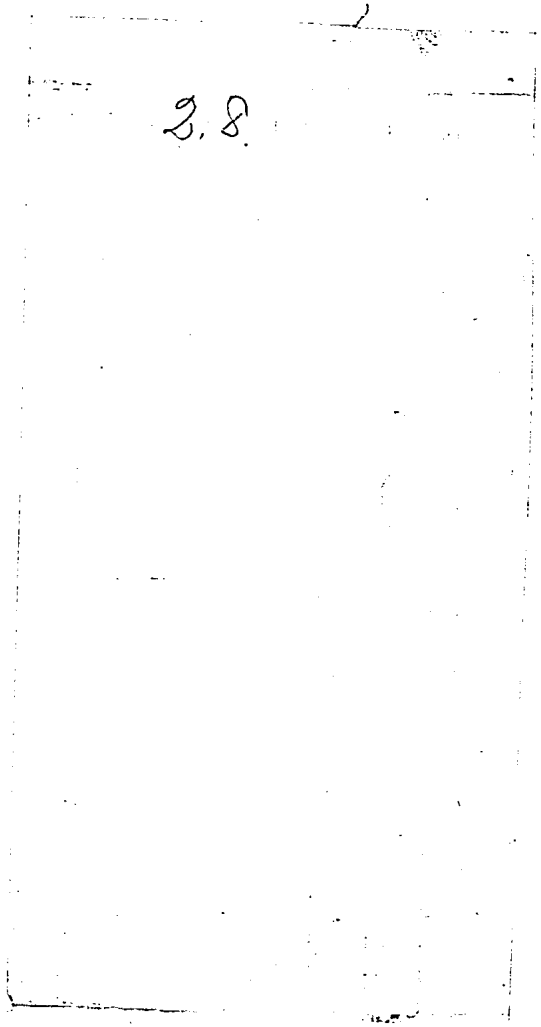
Av. Press 19.5 M.P. 60.45

Back end
Freight Engine 7 Boarded Cars
18 Tons

Bolt Spring
Main
Rec 74

Av. Press 20.22 M.P. 62.68

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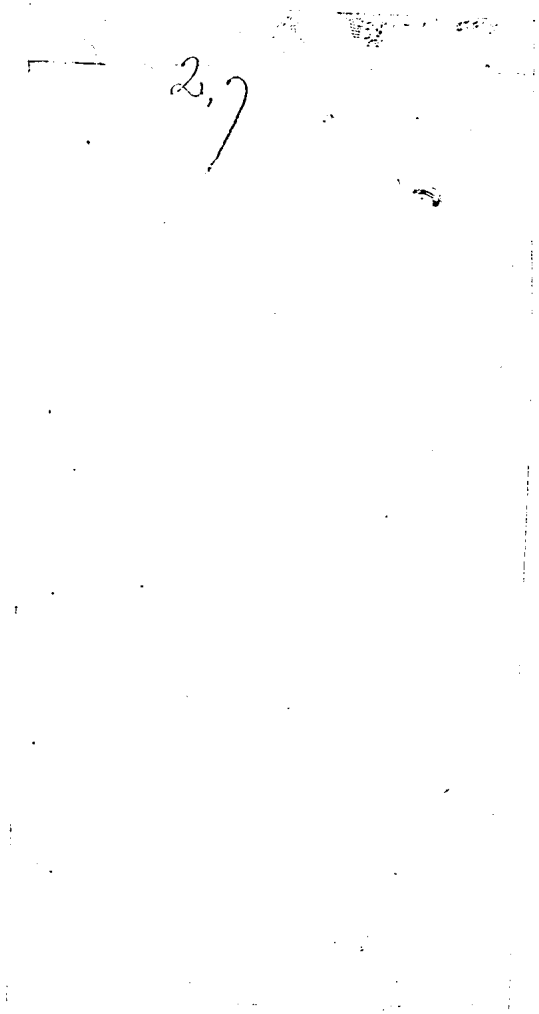
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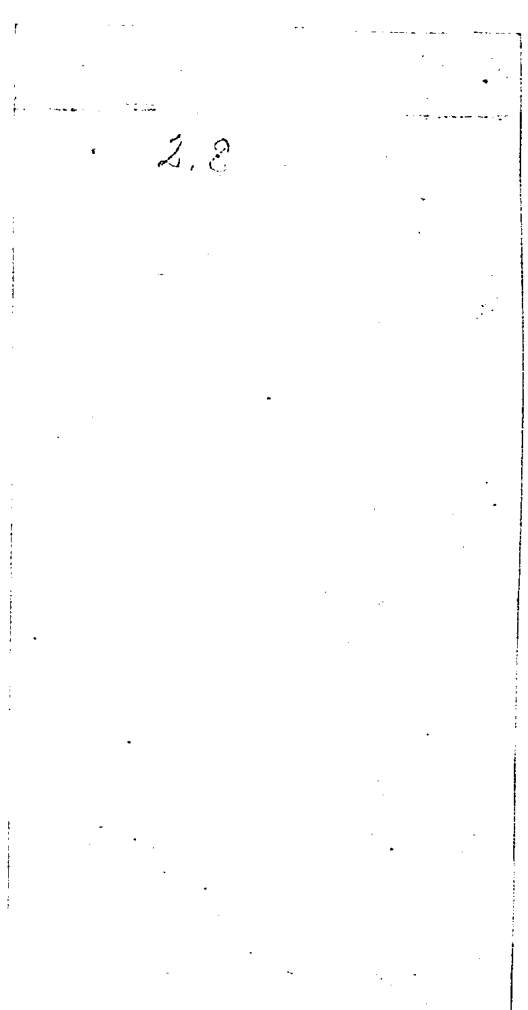

2.8

Head end
Freight Engine & Loaded Cars
18 Tons
Av. Press 19.59 A.P. 60.72

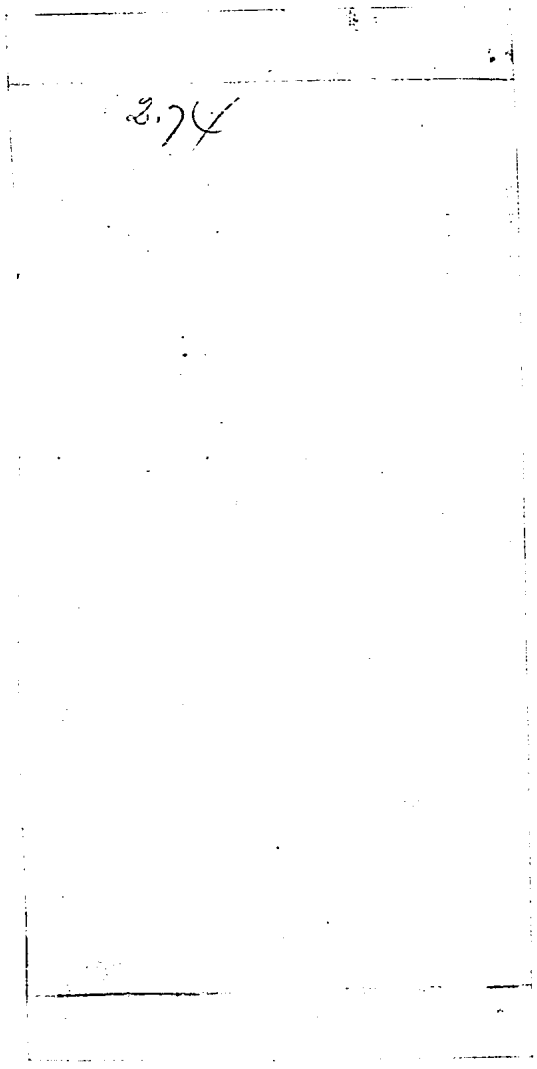
Short [illegible] Grade causing up grade.

Back end
Engine & Loaded Cars
18 Tons
Av. Press 20.1 A.P. 62.31

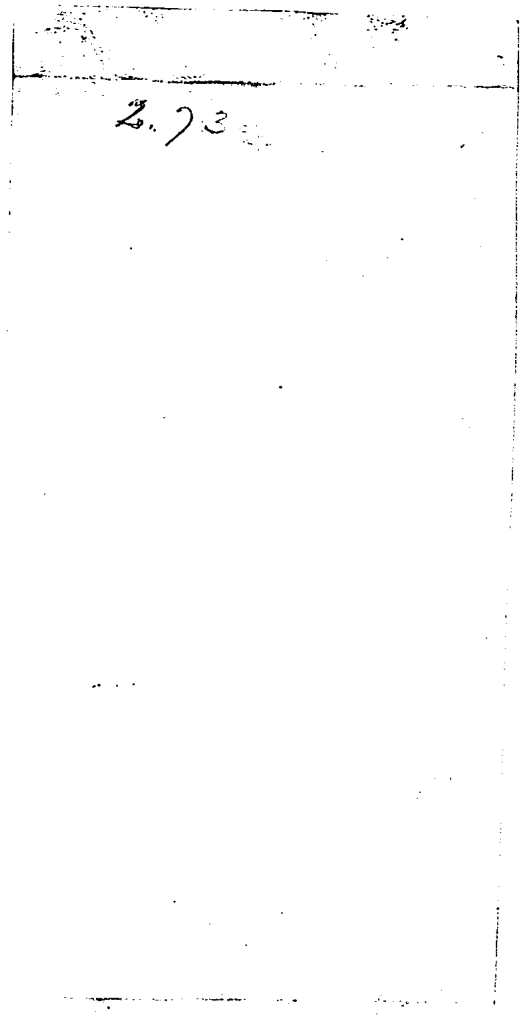
Short [illegible] Grade causing up grade

Head end
Freight Engine & Loaded Cars
18 Tons
Av. Press. 19.65 A.P. 62.68

Short [illegible] causing down grade


2.14


2.2


2.13

Back end
Freight Engine & Loaded Cars
18 Jan
Av. Press 19.2 A.P. 6.24

8000 ft away coming down grade

Front end
Freight Engine & Loaded Cars
18 Jan
Av. Press 17.55 A.P. 54.4

7300 ft away coming down grade

Back end
Freight Engine & Loaded Cars
18 Jan
Av. Press 19.8 A.P. 6.38

7300 ft away coming down grade

2.76

2.7

Head end
Freight Engine & 9 loaded Cars
18 Tons.

Av. Press. 17.94 H.P. 57.22

6800 ft away coming down grade.

Head end
Freight Engine & 9 loaded Cars
18 Tons

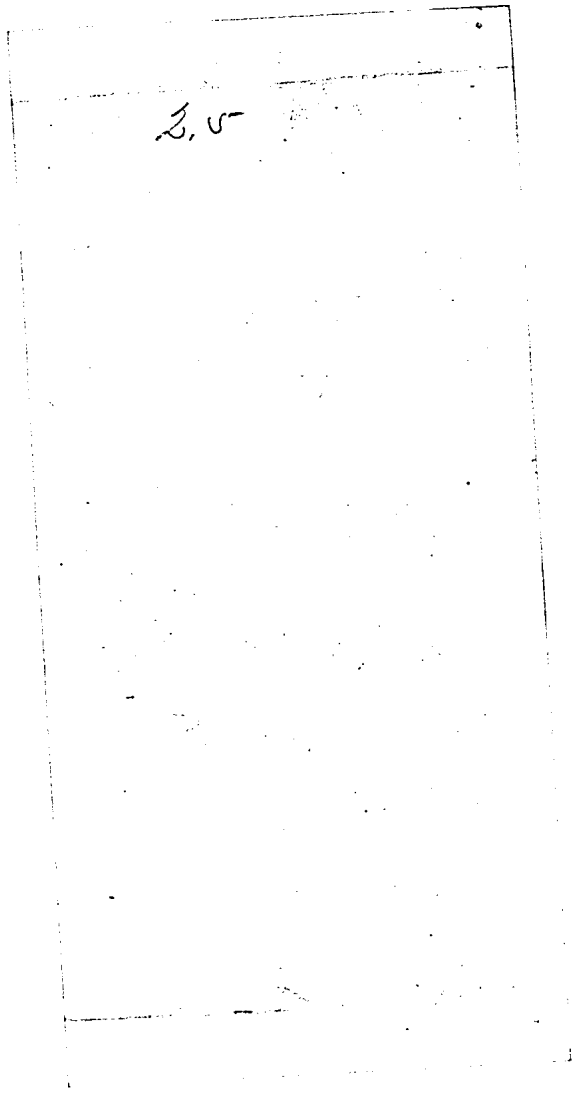
Av. Press. 17.94 H.P. 57.22

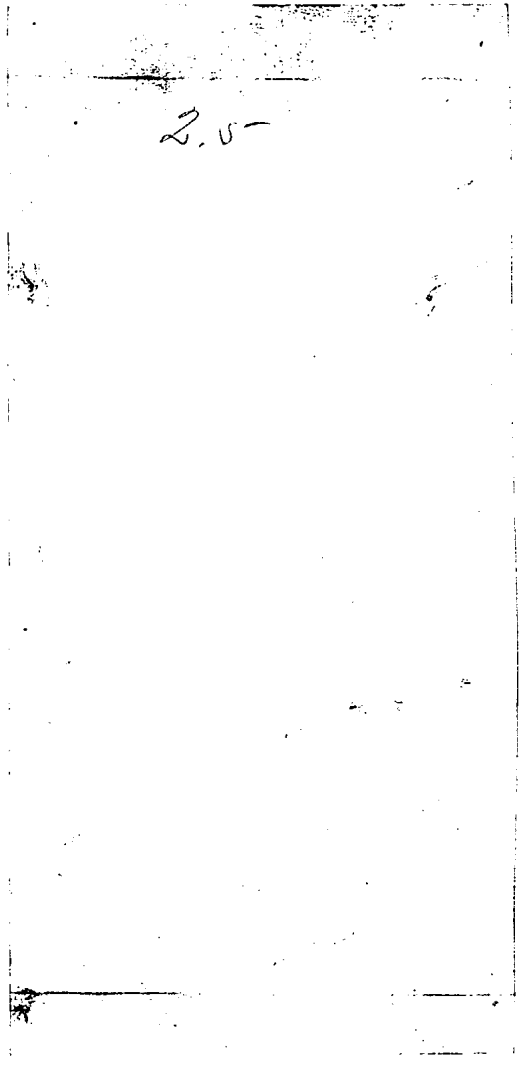
6800 ft away coming down grade

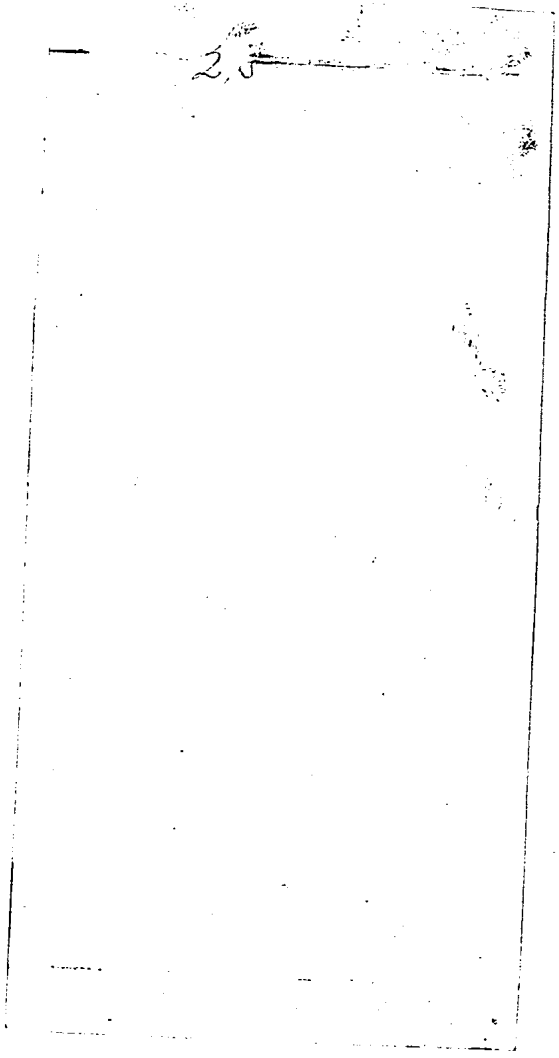
Head end
Freight Engine & 9 loaded Cars
18 Tons.

Av. Press. 18# H.P. 57.12

6800 ft away coming down grade







Back end
Freight Engine & Loaded Car
18 Tons
Av. Press 18# A.P. 57.42

11/16 dia. W
30 lb spring
Rec 2 6

6000 ft. 4.1% Hilly running down grade

Front End
Freight Engine & Loaded Car
18 Tons
Av. Press 18.9 A.P. 58.59

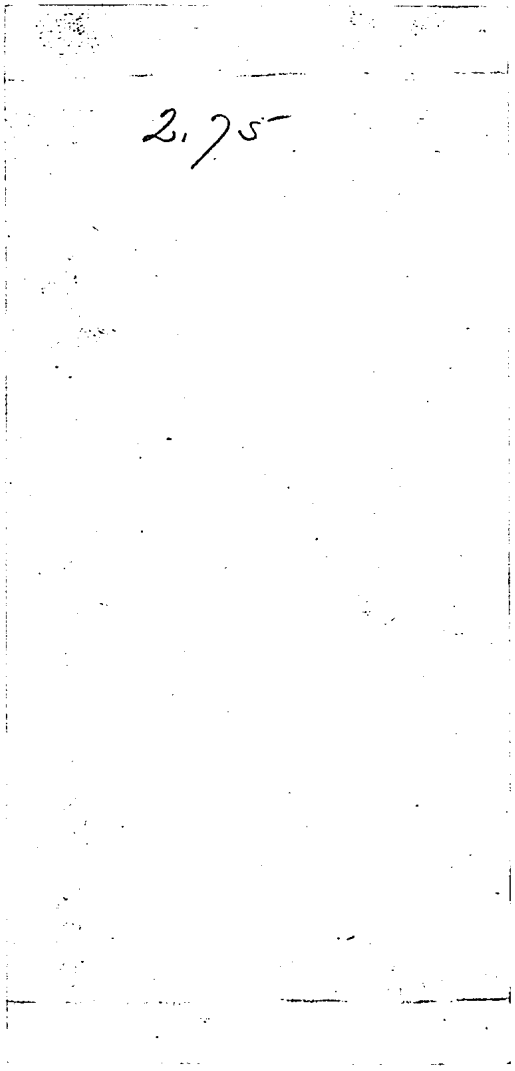
30 lb spring

5300 ft. Hilly running up grade

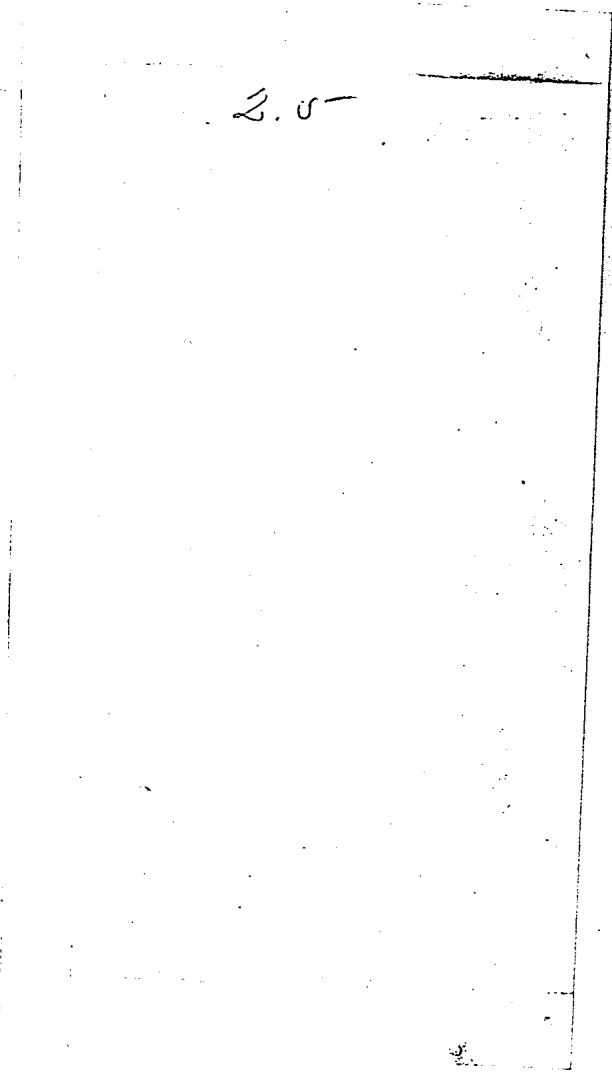
Back end
Freight Engine & Loaded Car
18 Tons
Av. Press 19.5# A.P. 60.45

11/16 dia. W
30 lb spring
Rec 7 4

5300 ft. Hilly running up grade


2.75


2.6


2.5

Front End
Freight Engine & 3 Loaded Cars
18 Jan.

11 S.D. adm
30 lb. Spring
Steam 5-0
Rev 75

Av. Runs 19.5 A.P. 61.42

4600 ft away running up grade
4.15

Back end
Freight Engine & 3 Loaded Cars
18 Jan

11 S.D. adm
30 lb. Spring
Steam 5-0
Rev 75

Av. Runs 20.94 A.P. 65.96

4.15
4600 ft away running up grade

Front End
Freight Engine & 3 Loaded Cars
18 Jan

11 S.D. adm
30 lb. Spring
Steam 5-0
Rev 75

Av. Runs 18.9 A.P. 61.04

4.18
4200 ft away running up grade

2.6

2.9

2.7

Back end
Freight Engine V8 loaded Cars
18 Jan.

Av. Puss 19.7 N.P 6363

4.18
4 Jan Hanway running off grade

Front end
Freight Engine V8 loaded Cars
18 Jan

Av. Puss. 21.87 N.P 70.64

3 Jan Hanway running off grade

Back end
Freight Engine V8 loaded Cars
18 Jan.

Av. Puss. 22.95 N.P 74.22

3 Jan Hanway running off grade
4.18

3.2

3.05

2.75

Front End
Freight Engine 70 loaded Cars
180 Tons.

11.55 Orig
30 lb spring

Av. Press 1930 N.T. 61.72

4.18
2500 ft away running upgrade

Back End
Freight Engine 70 loaded Cars
180 Tons

11.55 Orig
30 lb spring

Av. Press 198 N.T. 63.16

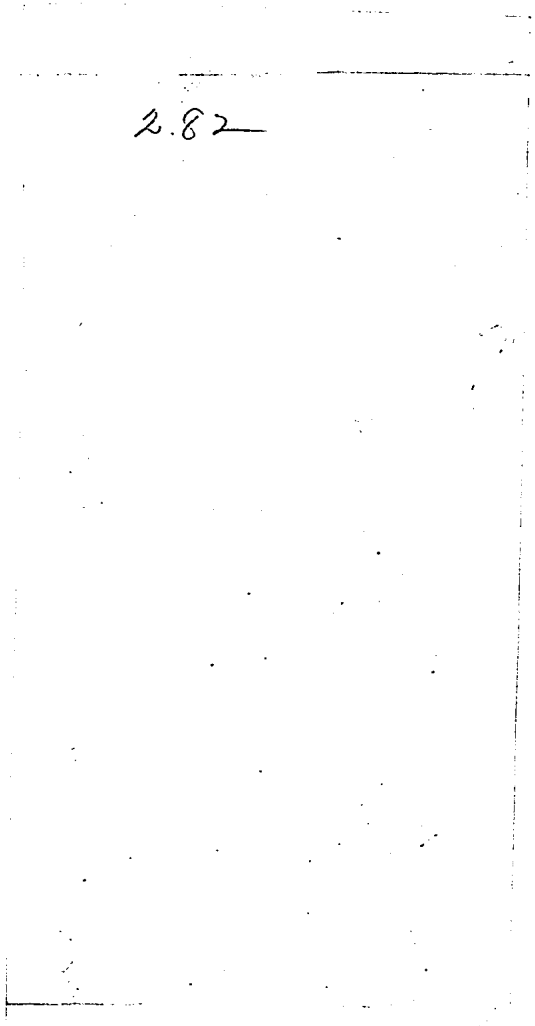
4.18
7500 ft away running upgrade

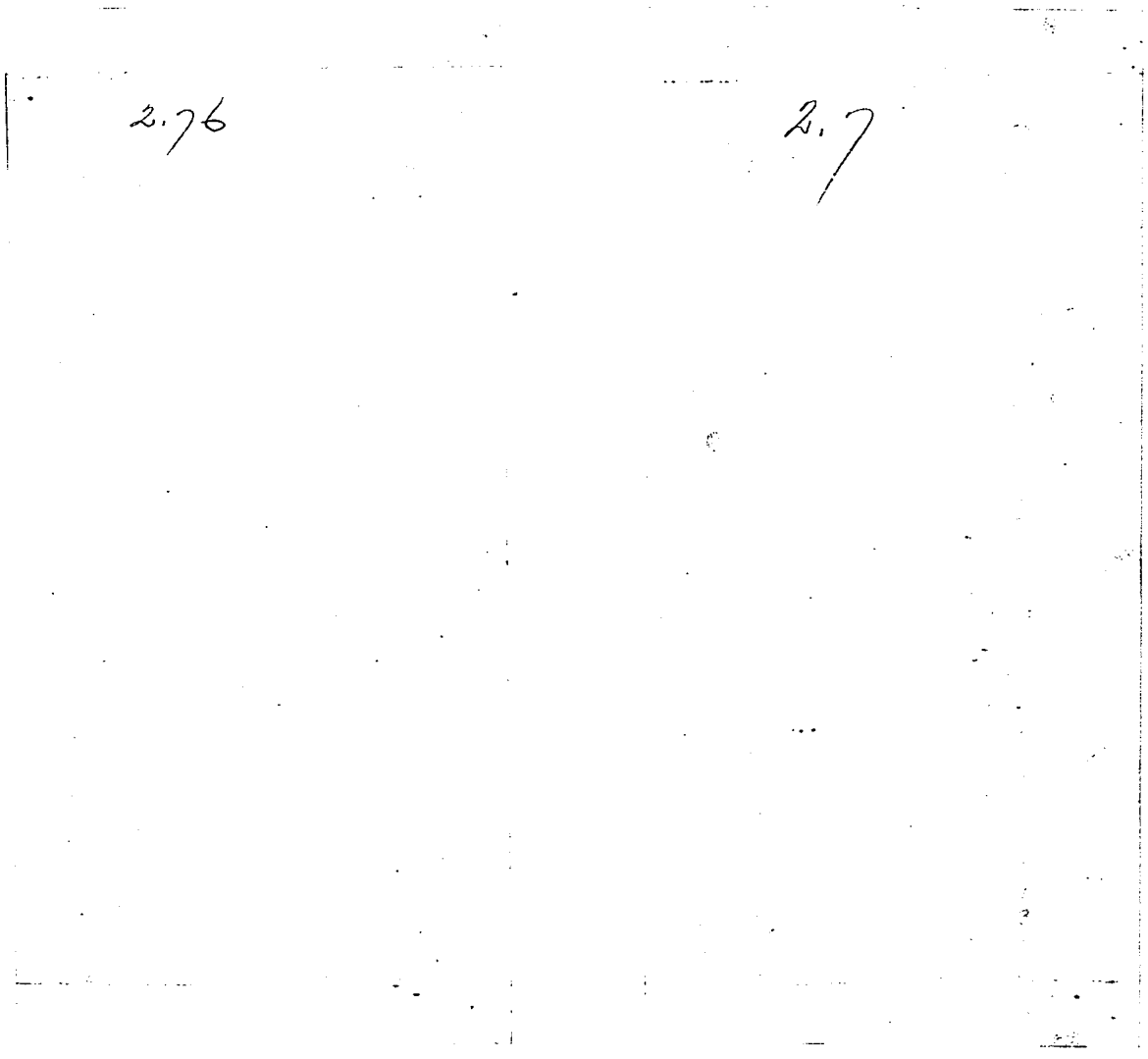
Front End
Freight Engine 70 loaded Cars
180 Tons.

11.55 Orig
30 lb spring

Av. Press. 2037 N.T. 64.16

1700 ft away running upgrade.


2.82


2.76
2.7

Back end
Freight Engine & Standard Car
18 Jan.

11 5/8 Dia
30 lb Spring

Av. Press 20.94 M.P. 6 5/96

1700 ft away coming up grade

Front end
Circuit Broken

11 5/8 Dia
30 lb Spring

Av. Press 10.47 M.P. 34.3

4.15

Back end
Circuit Broken

11 5/8 Dia
30 lb Spring

Av. Press 11.19 M.P. 36.65

4.15

1.55-

1.45-

2.9

Front end
Circuit broken

12:00 PM
30 lb spring
Run 15"

Av. Puss 9.9# A.T. 31.18

Back end
Circuit broken

12:00 PM
30 lb spring
Run 15"

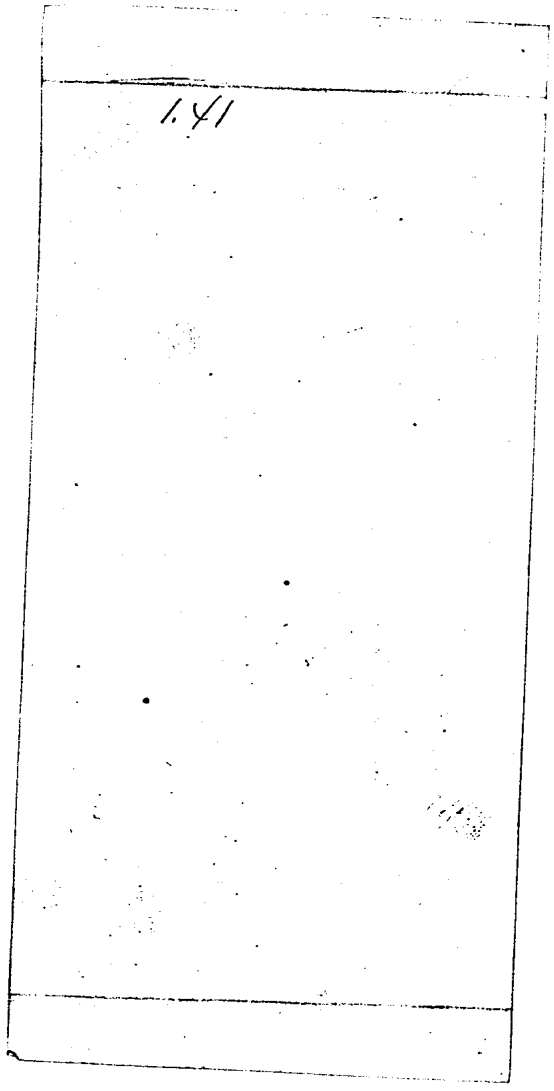
Av. Puss 10.83 A.T. 34.11

Front end
Circuit broken

12:02 PM
30 lb spring
Run 50
Run 39

Av. Puss 10.17# A.T. 33.74

4.15


1.41
1.5
1.37

Back end
Circuit Breaker

1202 Rev
Field Spring
Brake 50

Gen 75

Av. Press 10.83# M.P. 85.93

Front 50 lbs

Oldsmobile Running Instrument way

78 Rev—

Av. Press 6.1
M.P. 20.

H.15

1

Back 50 lbs B.P.

Oldsmobile Running Instrument way

78 Rev

Av. Press = 4.9#
M.P. = 16.

Cylinder
16X42 Piston rod 2 1/2

30 lb spring

Friction of Engine + 4 dynamos — no field

Constant = .0421166
Constant x revs and steam press = H.P.

H.2

2

Area = .85
Length =

Area = ?
Length =

Brake-

Spud

3 4.21

4 Av. Press 6.9 Front- M. P.

Spud

4.1

Brake 40 1/2 Rev. 30 spg

Middle 50 A.P.

Field on

#1 Av. Press 5.4 M. P. 17.05-

#2 " " " 5.7 M. P. 18.52

..one line is field on other " " off

5 4.17

1/ Ana = .75-
2 " " = .8

Ana = .9-

Ana = .9-

30 spg —

Front. 50 lbs B.p.

aluminum

Field on 77½ Rev

#1 Av. Pressure 5.76 M.T. 18.72

#2 " " " 5.04 M.T. 16.38

1 one Time field on

3 other " " off

6 4.15

BP 50 30 spring

Front - 78 Rev both Cases

1st field on -

2nd Track on -

#1 Av. Pressure 5.7 M.T. 18.24

#3 Av. Pressure 6.2 M.T. 19.84

1 4.1

BP 50 30 spring

Back - 78 Rev both Cases

#2

#1

1st field on

2nd Track on

#1 Av. Pressure 5.7 M.T. 18.24

#3 Av. Pressure 6.5 M.T. 20.8

4 4.14

#1 Ana = .8
#2 Ana = .9

#1 Ana = .8
#2 Ana = .85

#1 Ana = .8
#2 " " = .7

#1 Av. Pines 6.66# H.P. 21.77
#3 " " " 6.87# H.P. 22.76 78 Rev B.P. 50

front.

1st Tracks on
2nd " " 3 minutes

9 4.12

78 Rev 50 BP

Birdc

1st Tracks on
2nd " 3 minutes

#1 Av. Pines 6.65 H.P. 21.28
#3 Av. Pines 6.09 H.P. 19.91

10 4.18

Av. Pines 8.4#
H.P. 27.13 77 front.

443.

11 4.12

Ana = 1.17

1 Ana = .91
2 Ana = .85

1 Ana = .92
2 Ana = .95

Brass smelling wrong with headache in previous Cardi

Av. Press 7.95 — 77 Front.
H.T. 25.71

443

4.5

12

Av. Press. 11.13
H.T. 35.58 Back 76 Rev.

444 pm

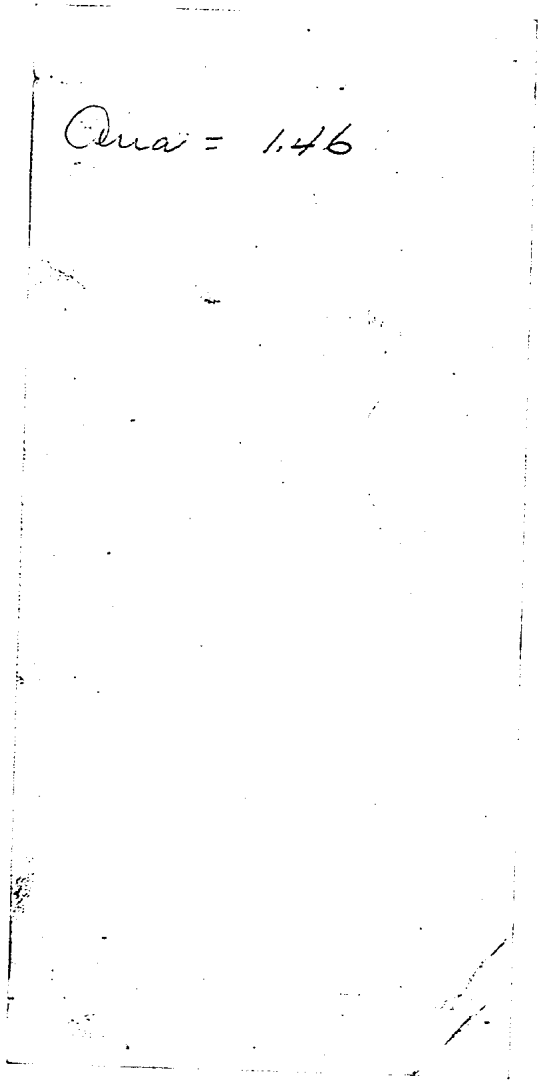
4.17

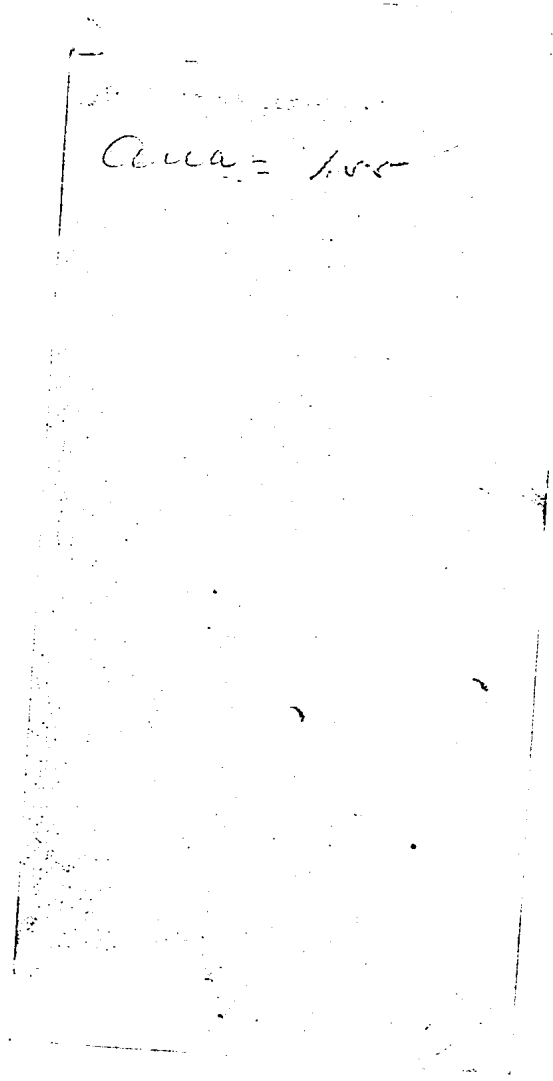
13

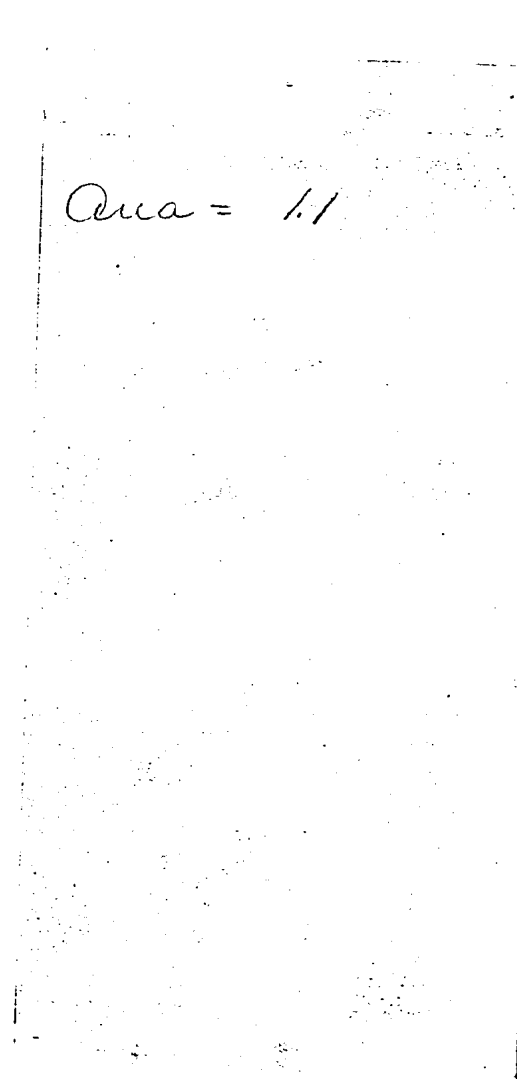
Av. Press 10.6
H.T. 33.83 Front 444 pm — 76 Rev

4.13

14


Qua = 1.46


Qua = 1.06


Qua = 1.1

Av. Time 17.05 Front 7.5 Rev
A.T. 65.42 4.46 pm

15

Av. Time 18.8 Back 7.5 Rev
A.T. 57.64 4.46 pm

16

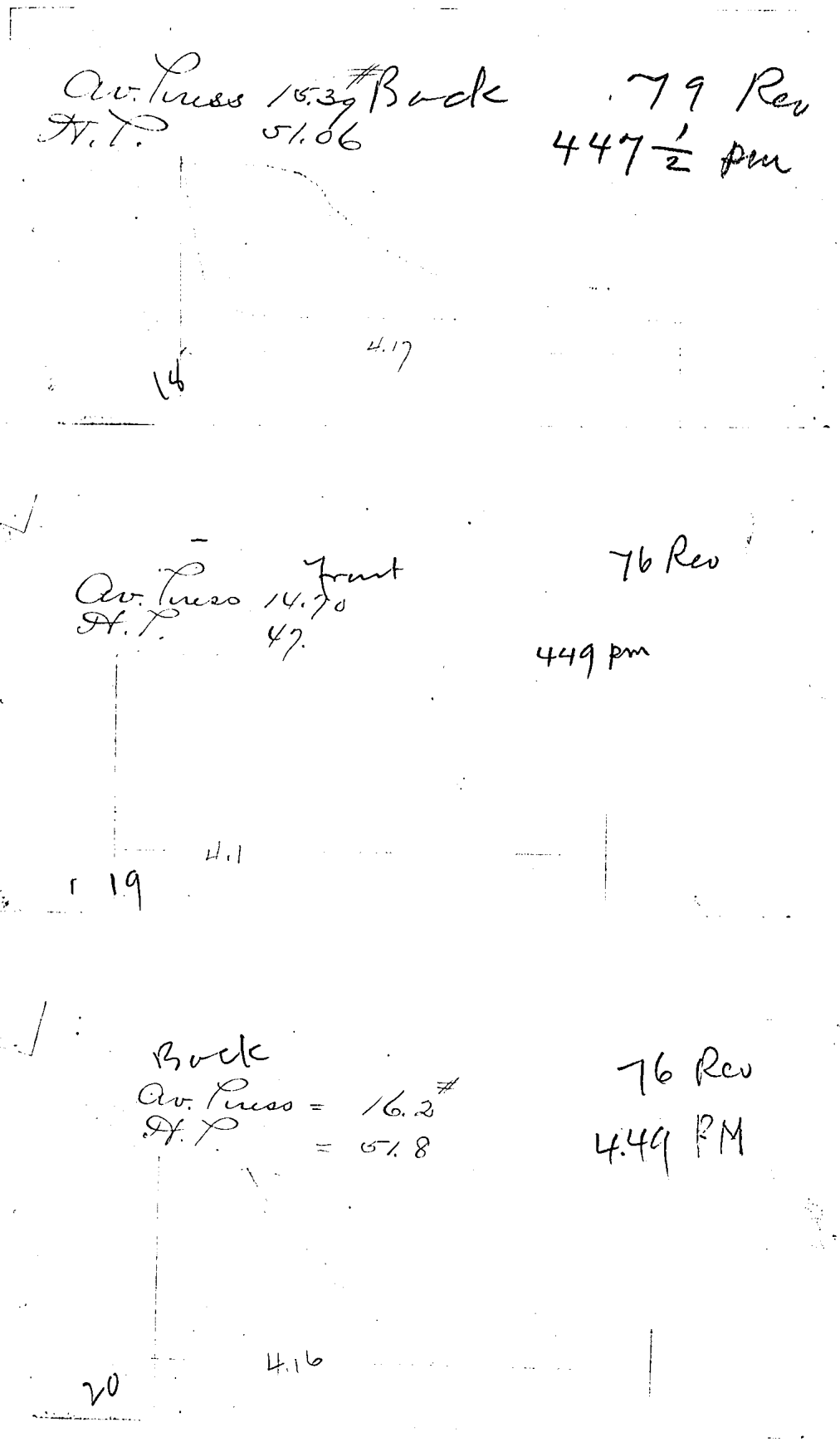
Av. Time 15 7.9 Rev
A.T. 49.5 Front 4.47½ pm

17

Area = 2.05 ft

Area = 2.55

Area = 2.4


Av. Press 16.39 # Back
H.P. 51.06
.79 Rev
447 1/2 pm
4.17
14
Av. Press 14.70 Front
H.P. 47.
76 Rev
449 pm
4.1
19
Back
Av. Press = 16.2 #
H.P = 51.8
76 Rev
4.49 PM
4.16
20

Area = 2.25
Length =

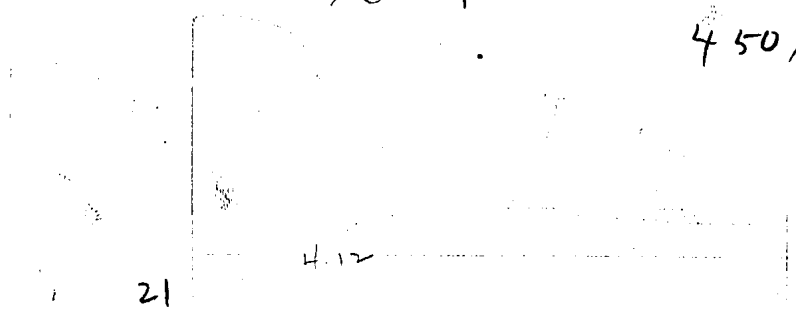
Area = 2.01
Length =

Area = 2.1

76 Rev

Av. Russ 10.17
H.T. 32.16 Front

4 50 1/2 pm




21

76 Rev —

Av. Russ 11.21 Bardc
H.T. 32.37

450 1/2 pm


22

76 Rev

Av. Russ. 15.66
H.T. 49.98 Front

4 52 1/4 pm


23

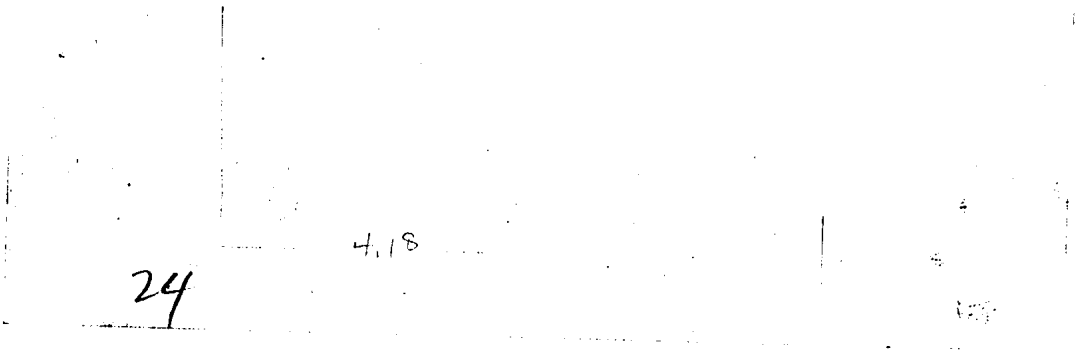
$a_{wa} = 2.17$

$a_{wa} = 1.5$

$a_{wa} = 1.4$

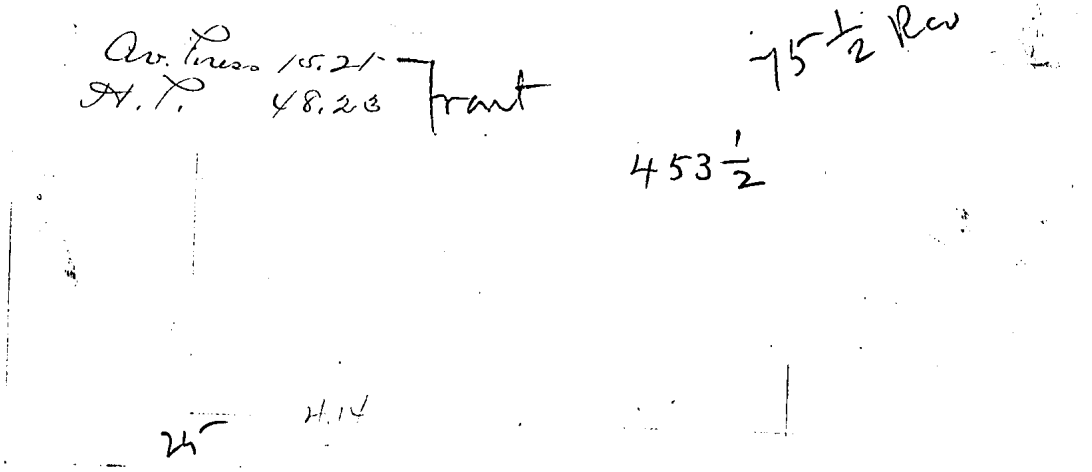
76 Rev

Av. Press 16.86 Back 452 1/4 pm
H.P. 53.99



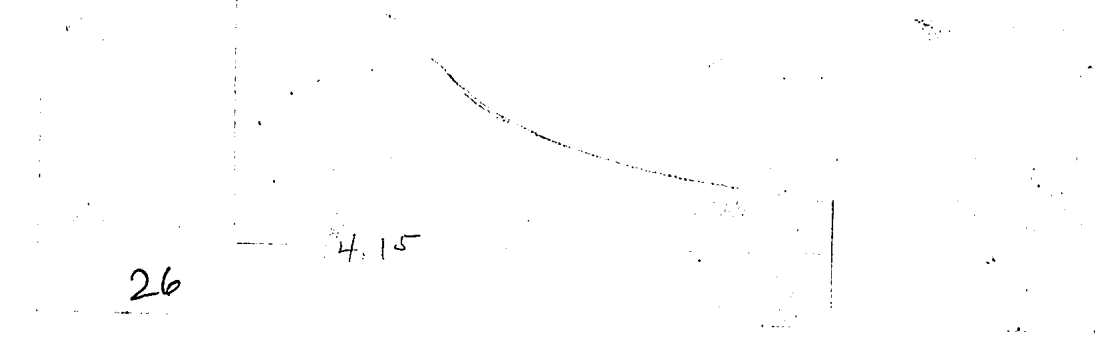

Av. Press 15.21 Front 75 1/2 Rev
H.P. 48.23

453 1/2




Av. Press. 12 Back 75-1/2 Rev
H.P. 54.2

453 1/2



Ana = 2.K

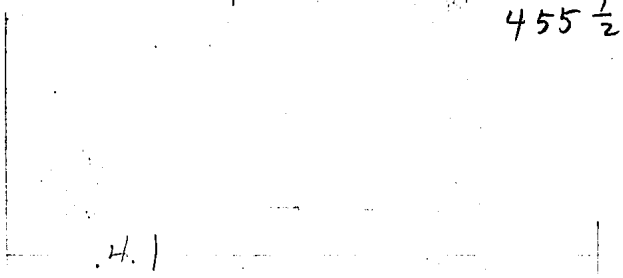
Ana = 2.1

Ana = 2.35-

Av. Pmss. 15.27
H.T. 48.7/8 Front

76 Rev

455 ½ pm

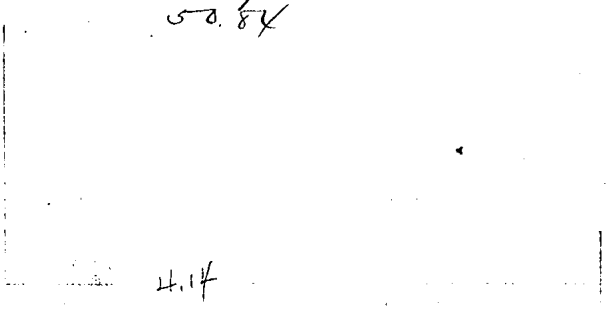



24

76 Rev

Av Pmss. 15.93 Brake #
H.T. 50.8/8

45-3-½ pm




24

Av. Pmss. 16.14 Front
H.T. 50.16

Rev 74

457 ¼

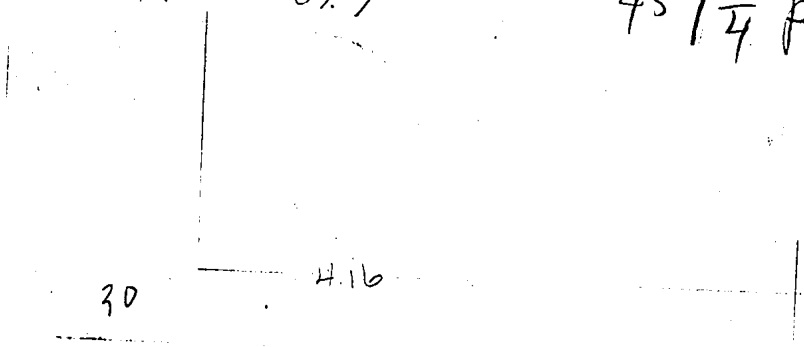

29

$a_{ma} = 2.22$

$a_{ma} = 2.2$

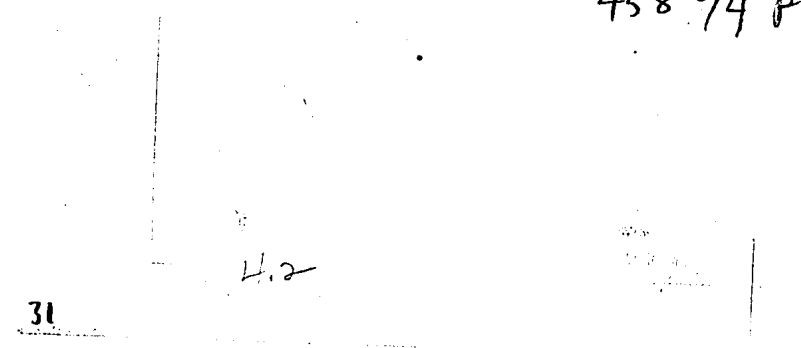
$a_{ma} = 2.09$

Av. Press 16.7 Back Rev 74
N.P. 51.9
45 7 1/4 pm



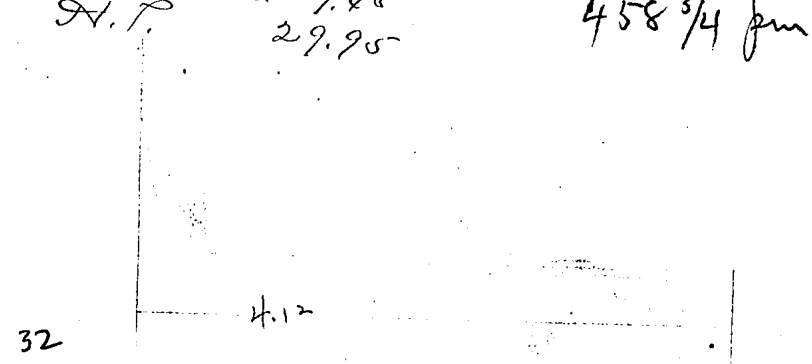

30

Av. Press 10.14 Back Rev 75-1/2
N.P. 32.23
45 8 3/4 pm



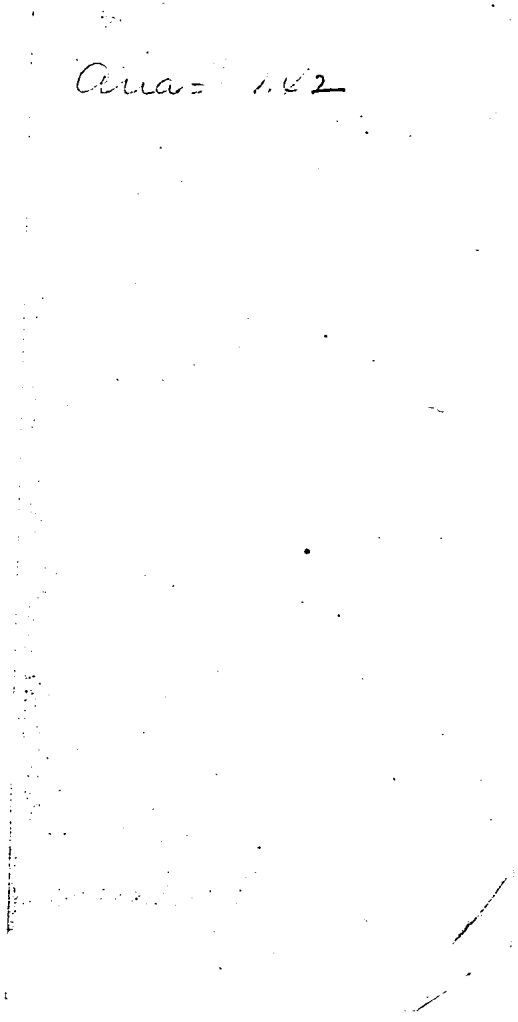

31

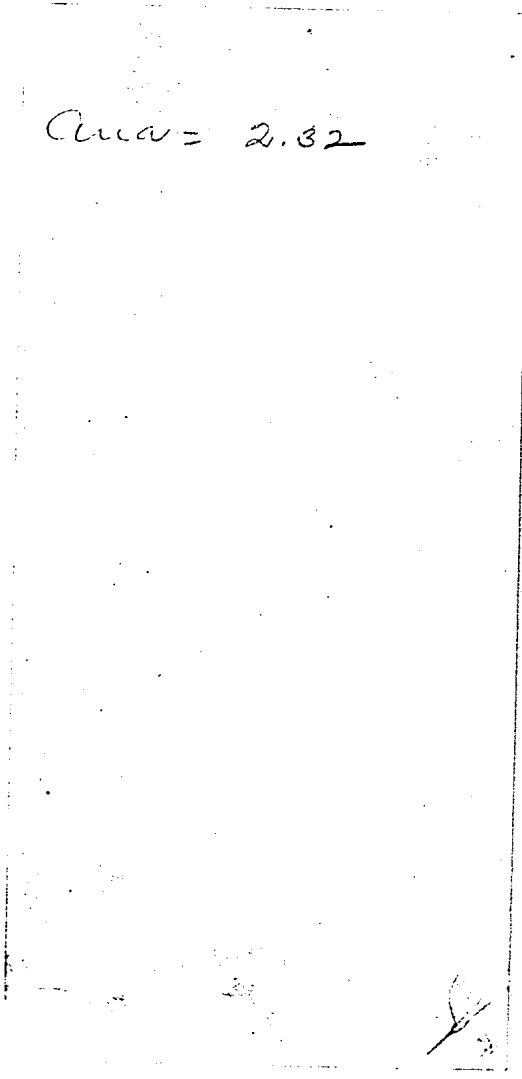
Av. Press. 9.8 Front Rev - 75-1/2
N.P. 29.95
45 8 3/4 pm




32


Ana = 1.3


Ana = 1.62


Ana = 2.32

Rev 77.

Av. Press 9.2
A.T. 29.44 Brake 5-01 pm

33 4.2

Av. Press 9.6
A.T 30.72 front 5-01 pm Rev 77

7 people in Car
2 in Loco —

34 4.15

1 Av. Press 9.27 A.T 29.94
2 " " 5.70 " " 18. front.
3 " " 7.00 " " 24.22

1 only brake Steamout
2nd Without brake or field Dynamic
3rd with field — middle

77 Rev

35 4.2

Area 1 = .8 Length =
Area 2 = 1.05 Length =
Area 3 = 1.8 Length =

Area = 1.35

Area = 1.3

Av. Puss 6.3 # Buck
N. P 20.4

77 Rev

4.2

36.

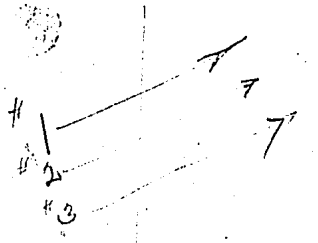
#1 Av. Puss 9.03 N. P 28.8 Front. 1st 77 Rev
#2 Av. Puss 7.95 N. P 25.67 2+3rd 77 Rev
#3 Av. Puss 6.12 N. P 19.7 Track in
2nd Track off Field in
3rd Field off

3.4

37

4.15

#1 Av. Puss 10.3 N. P 32.85 Buck 1st 77 Rev
#2 Av. Puss 7.5 N. P ?? 2+3rd 77-11
#3 Av. Puss 5.7 N. P 18.2 1 Track in
2nd Track off Field in
3rd. Field off =




4.2

36

Area of square card
= 9
length =

(3) Area = .85 - length =
2 " " = 1.1 " " =
4 " " = 1.25 " " =

3 Area = 8
2 Area = 1.05
4 Area = 1.45

Nov. 22/80

Mr. Edison

Here are the first set of cards with passenger armature.

Yr. Truly

Chas. L. Clark

Taken Sunday 19th

Nov. 23/82

T. A. Edison, Esq.

Dear Sir

I return your letter cards
herein with freight bills.
The leakage is but a small
part of what it was on
Sunday. I cannot understand
how so much power
[illegible]

Yours

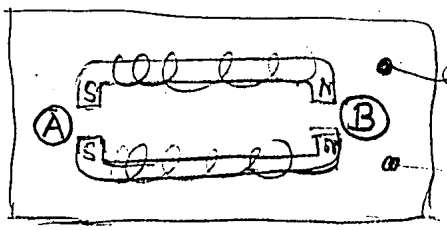
Chas. L. Clark

20

Freight Loco 4 cars

Important

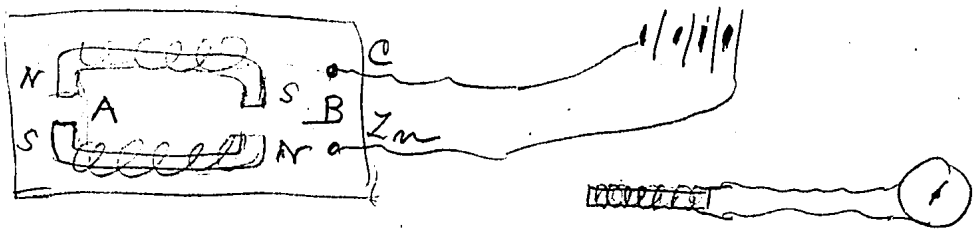
Experiments




George Gibbs
Dec 1st
1912

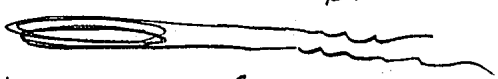
Like poles opposed: —
Exh. III - With coil and iron core. —
Passing coil in at (A) deflection — right.
" " out- " (A) " — left.
" " in at- (B) " — left.
" " out- " (B) " — right.
" " in " (A) " — right
and throughout- " (B) " left.
When, — reversing coil end for end, has back in at- (B) — left — through and out- at (A) right.
Reversing the coil and for end, reverses the direction of deflection in each case.

Without iron core the directions of deflection are the same in each case but magnitude is not nearly so great. With iron core the deflection is very great, showing that the core very much increases the inductive current



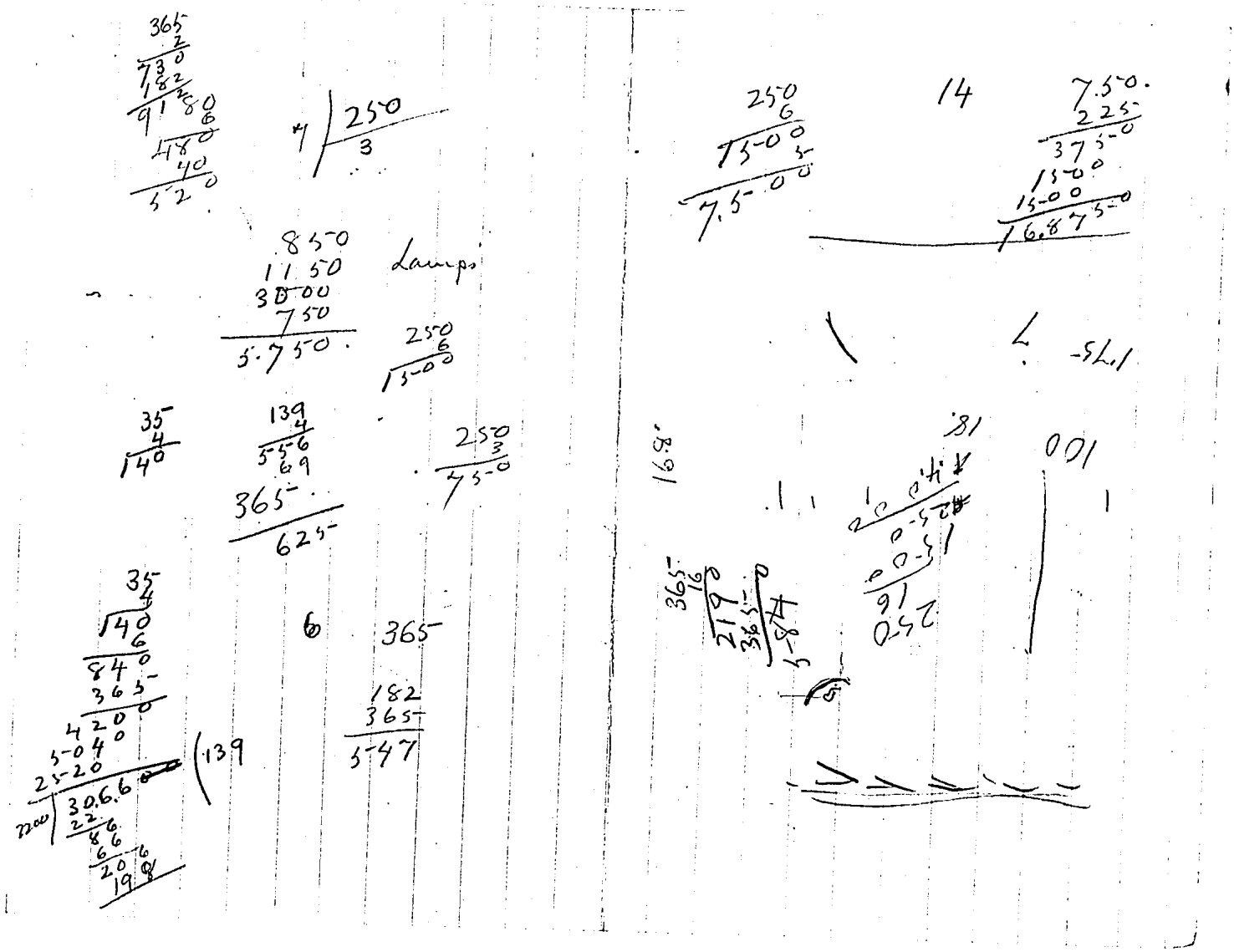

With coil and soft iron core, and magnets coupled up as shown with unlike poles opposite, I obtained no deflection in galvanometer when lines of force were cut by coil passing between poles. But if the coil was passed through nearer one pole than the other a slight deflection was obtained, due to unbalanced magnetic forces.

I also tried passing through the magnets arranged as above a piece of wire looped several times around either a wooden or iron core, thus.—

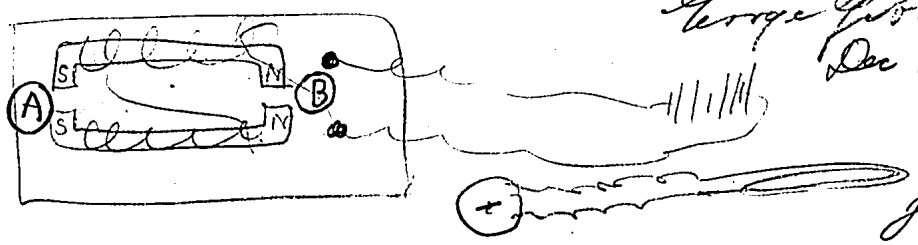


The results were the same as with the coil.

The iron core in these cases merely increases the strength of the induced current. (when any).


Lamps

George Gibbs
Dec 1st
1892.




J. F. Gibbs

Exh IV — Wire loop with iron core like former apparatus. —

In at- (A) — deflection - left-.
Out- " (A) " right.
In " (B) " right.
Out- " (B) " left.
In " (A) (left) through & out- at (B)
def. — (right).

Reversing loop end for end the deflection remains the same in each case above.

Passing coil from above down through at- (B) (like former Exp. C). — deflection - right.
+ passing coil up — deflection - left.

Same operation at- (A): —

Down — left-
Up — right.

The results are the same in all cases if the iron core be omitted, except that the current induced is very much

(over)

Remarks: —

The induced current is nearly as strong with the loop as with a coil, and unless the core have an iron one, the deflection by galvanometer is very slight. I only just perceptible

J.J.

(1882)

Try two Lead plates in Conc Sol Sulphide Soda
hard soft
Try Carbon ~~and~~ in hot Sol Sulphide Soda

Try Copper plates + Iodide potassium. also Copper plate coated with Iodine after roughening so as to make Coating Iodide Copp use Iodide pot Sol also $SO_2$ in another Experiment

Fred Dr Kentwesmyth

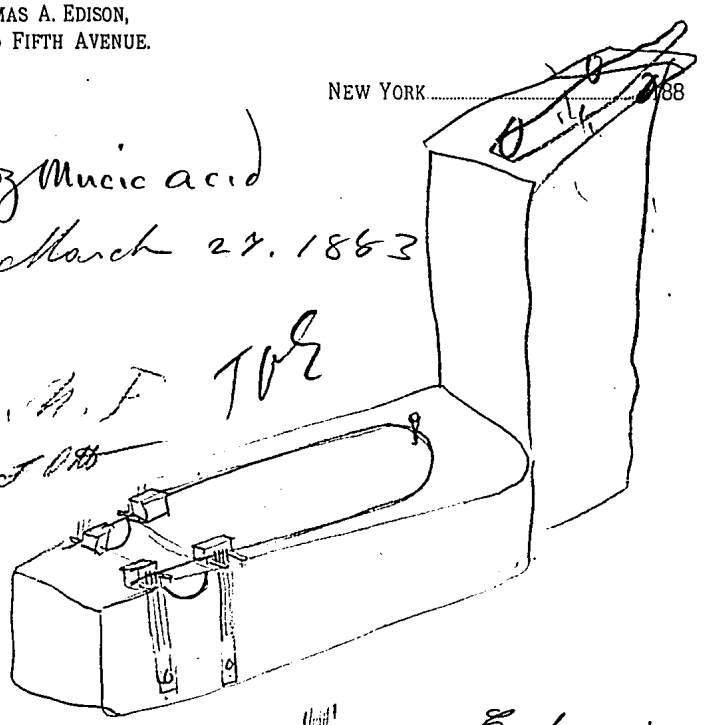
UNBOUND NOTES AND DRAWINGS

1883

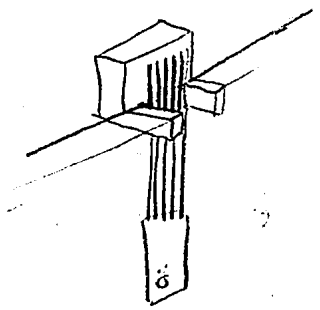
THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK..... 188

1 oz Mucic acid
March 27. 1883

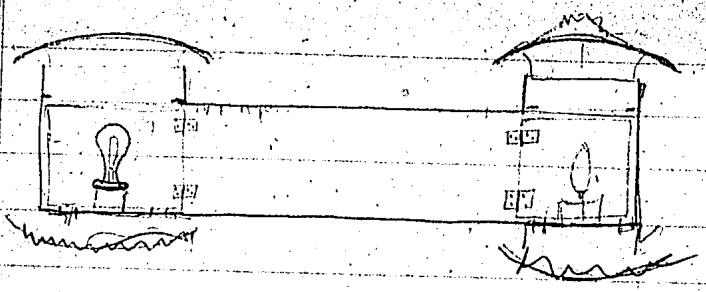


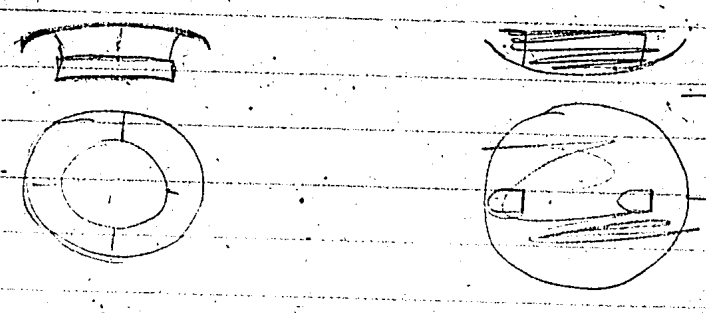
Carbonizing or
Hydrocarbon deposit

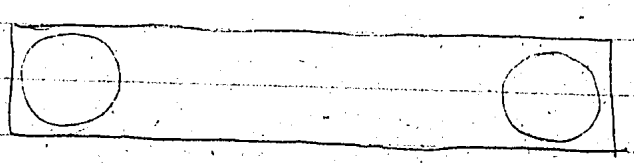


29 MAR 1883 29 MAR 1883

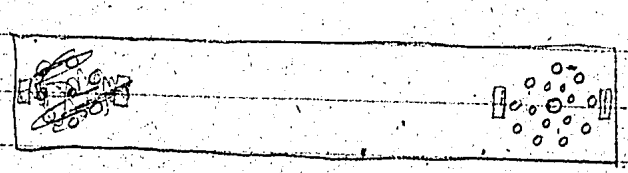
Mill Plotting 1883-03-29







Top

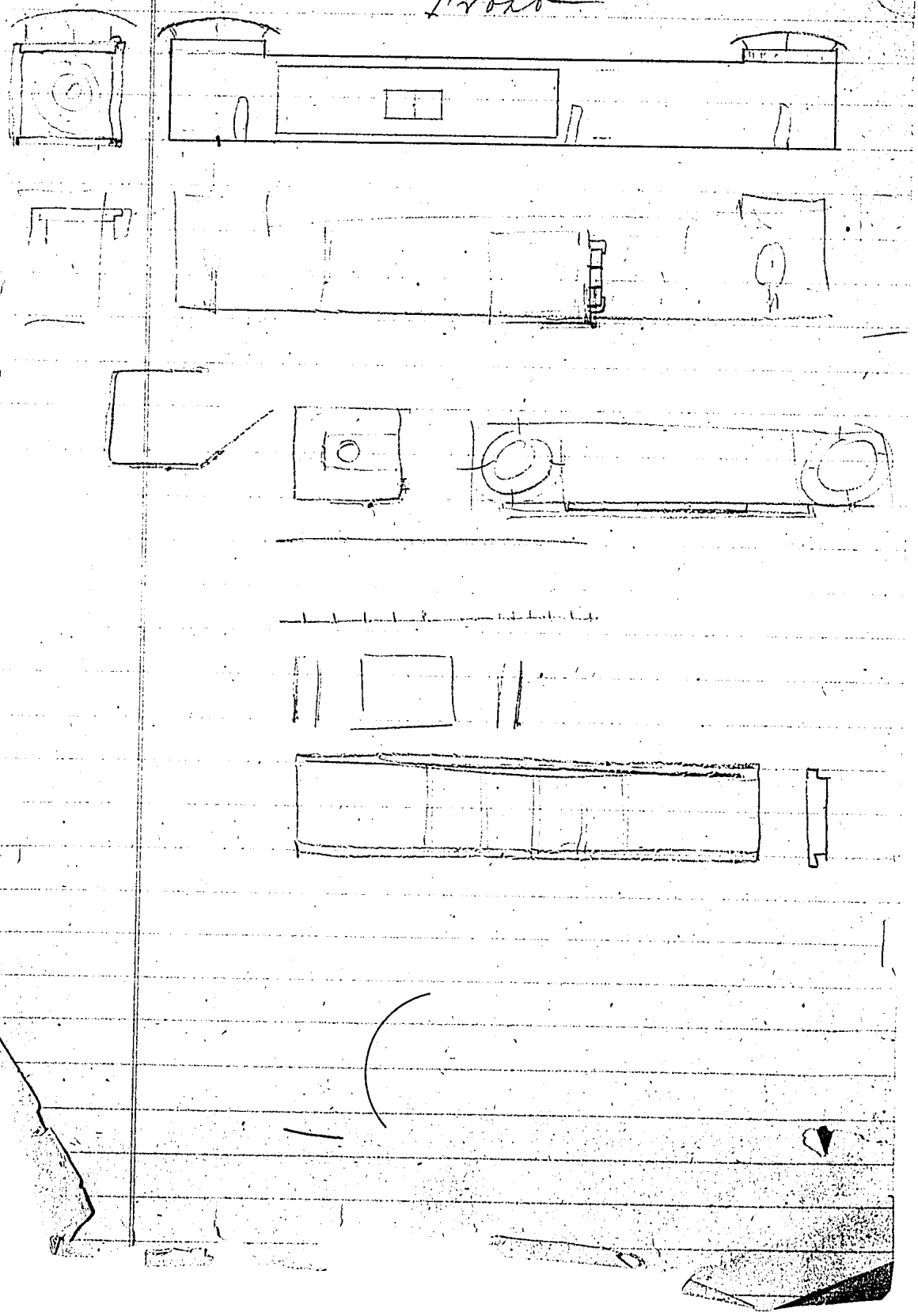


Bottom

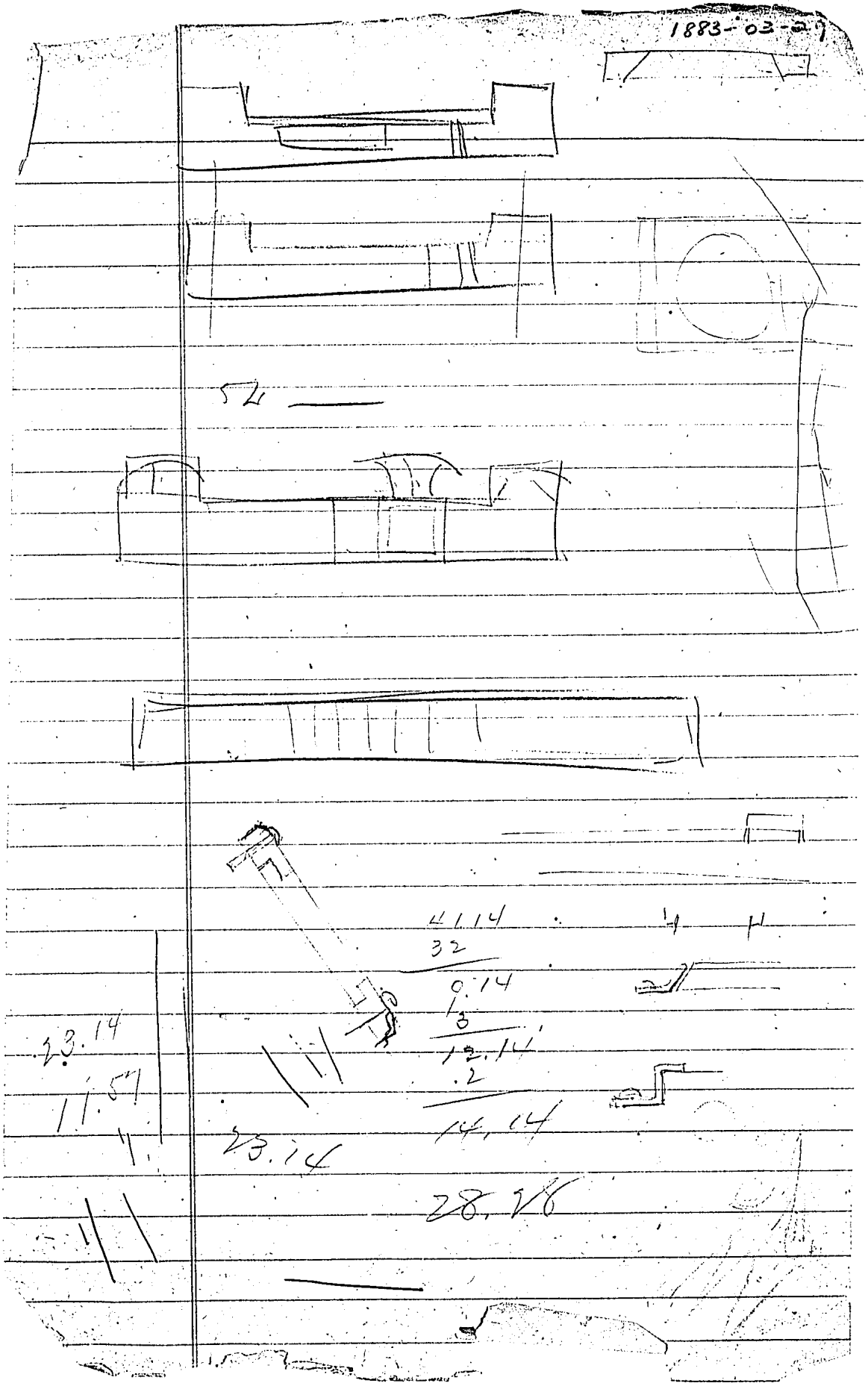
34.0.8

1883-03-29

Front



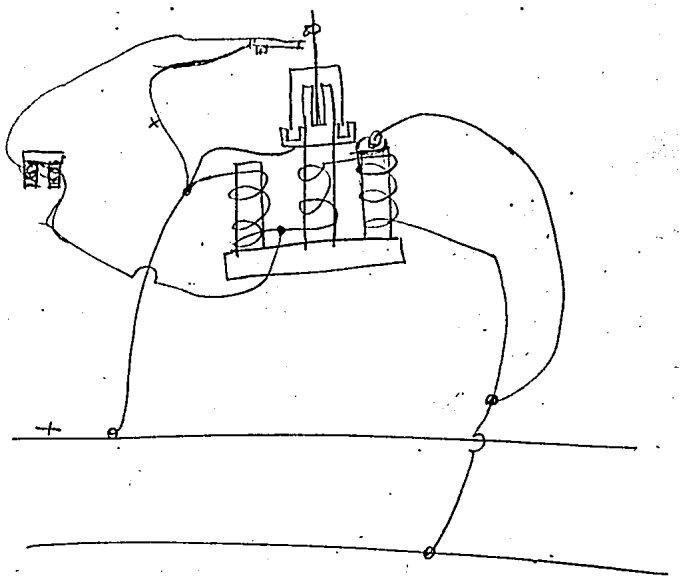
1883-03-29



Meter

May 17, 1883

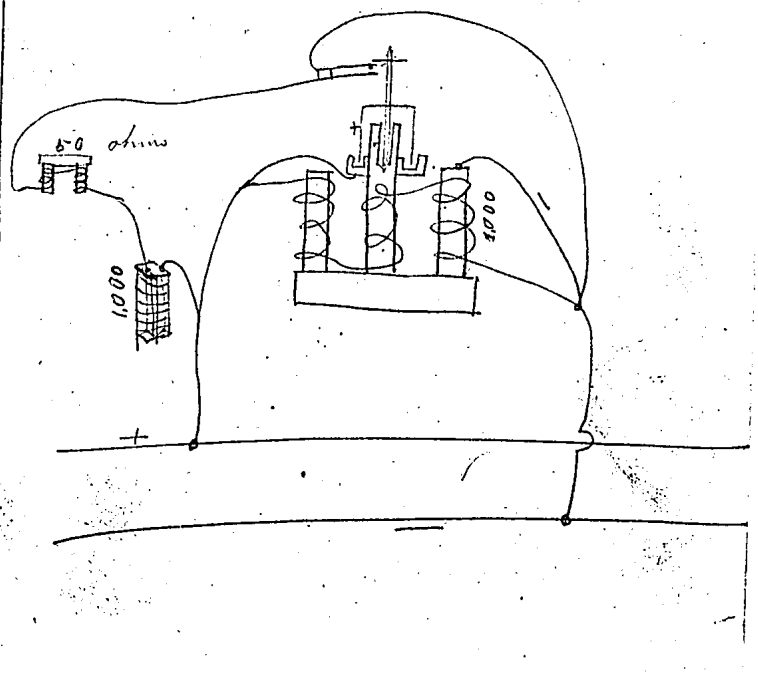
J. F. O.



May 17, 1883

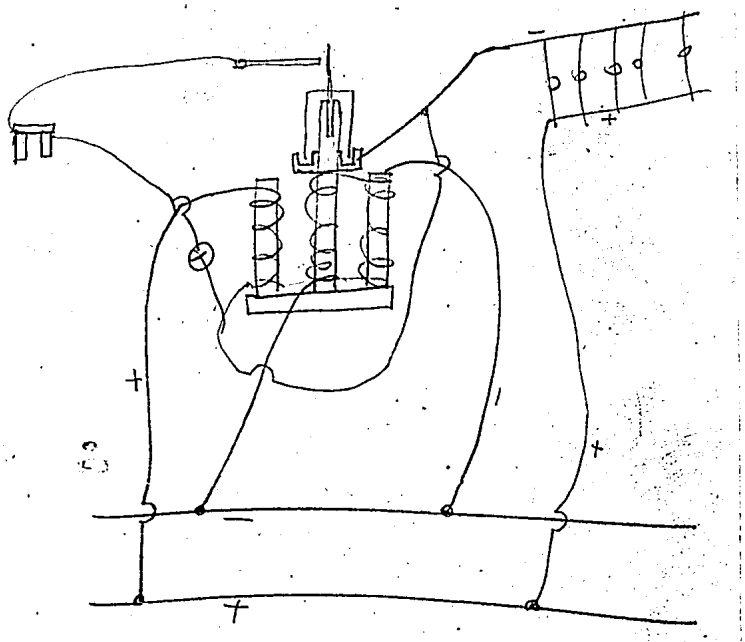
J. F. O

Meter



Notes May 17, 1883

J. F. O.



# Notes on Dynamos.

| Class | Section of Coils and Poles | No. of Lamps A | No. of Lamps B | Dia. of Armature | Effective Length of Armature | Out Side Diameter | Sq. Inches of Wire Surface | No. of Divisions | Ohms Resistance of Armature in Ohms | Average Revs. per Minute | Average Feet Speed per Min. | Size of Wire Bare | Size of Wire Covered | No. of Loops | Coils per Loop | Ft. of Wire per Loop |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volts 110 | | 15 | | | | | | | .50 | | | | | 4 | 2 | 3528 |
| M | | | | 4¾" | 7" | 5" | 125" | 54 | | 2200 | 2880 | .042 | .051" | | | |
| 55 | | | 30 | | | | | | .09 | | | | | 4 | 4 | 1050 |
| 110 | | 60 | | | | | | | .14 | | | | | 2 | 6 | 10554 |
| L | | | | 8¾" | 11 | 10" | 345" | 54 | | 2200 | 3140 | .042 | .05" | | | |
| 55 | | — | 120 | — — | — — | — — | — — | — — | .038 | — — | — — | — — | — — | — 1 — | — 12 — | 21168 |
| 110 | | 150 | — | — — | — — | — — | — — | — — | .068 | — — | — — | — — | — — | — 2 — | — 6 — | 25350 |
| L | | — | — | 9 11/16" | 22" | 10½" | 726" | 54 | — — | 850 | 2340 | .065 | .095" | — — | — — | — — |
| 55 | | | 300 | | | | | | .01" | | | | | 1 | 12 | 50700 |
| 110 | | 250 | | | | | | 54 | .032 | | | | | 1 | 10 | 42250 |
| K | | | | 9¾" | 30" | 10½" | 990" | | | 900 | 2560 | .065 | .095" | | | |
| 55 | | — | 500 | — — | — — | — — | — — | 32 | .009 | — — | — — | — — | — — | — 1 — | 20 — | 84500 |
| 110 | | 350 | | — — | — — | — — | — — | — — | — — | — — | — — | — — | — — | — — | — — | — — |
| H | | | | 9¾" | 30½" | 10½" | 1000" | 54 | .021 | 1200 | 3300 | .065 | .095 | — 1 — | 12 | 50700 |

May 27 1893

The Edison Electric Light Co. N.Y.

Common writing Ink
July. 13. 1883.
J. F. Ott

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

Common writing Ink
July. 13. 1883.
J. F. Ott

CABLE ADDRESS—EDISON

This mark was made with cotton on drum
July 18. 1883
J. F. Ott

This mark was made with this paper laying direct on metalic drum used no Chemicals
July 18. 1883
J. F. Ott

Caustic Soda on felt
slightly moist
July 18. 83
J. F. Ott

Best of all
This mark was made with cotton on drum and slightly moistened with Caustic Soda makes plain and straight line
July 18 1883
J. F. Ott

This mark was made with this paper laying direct on metalic drum used no Chemicals
July 18, 1883
J. F. Ott
this mark is not so straight as with the yellow paper I suppose it has lower resistance

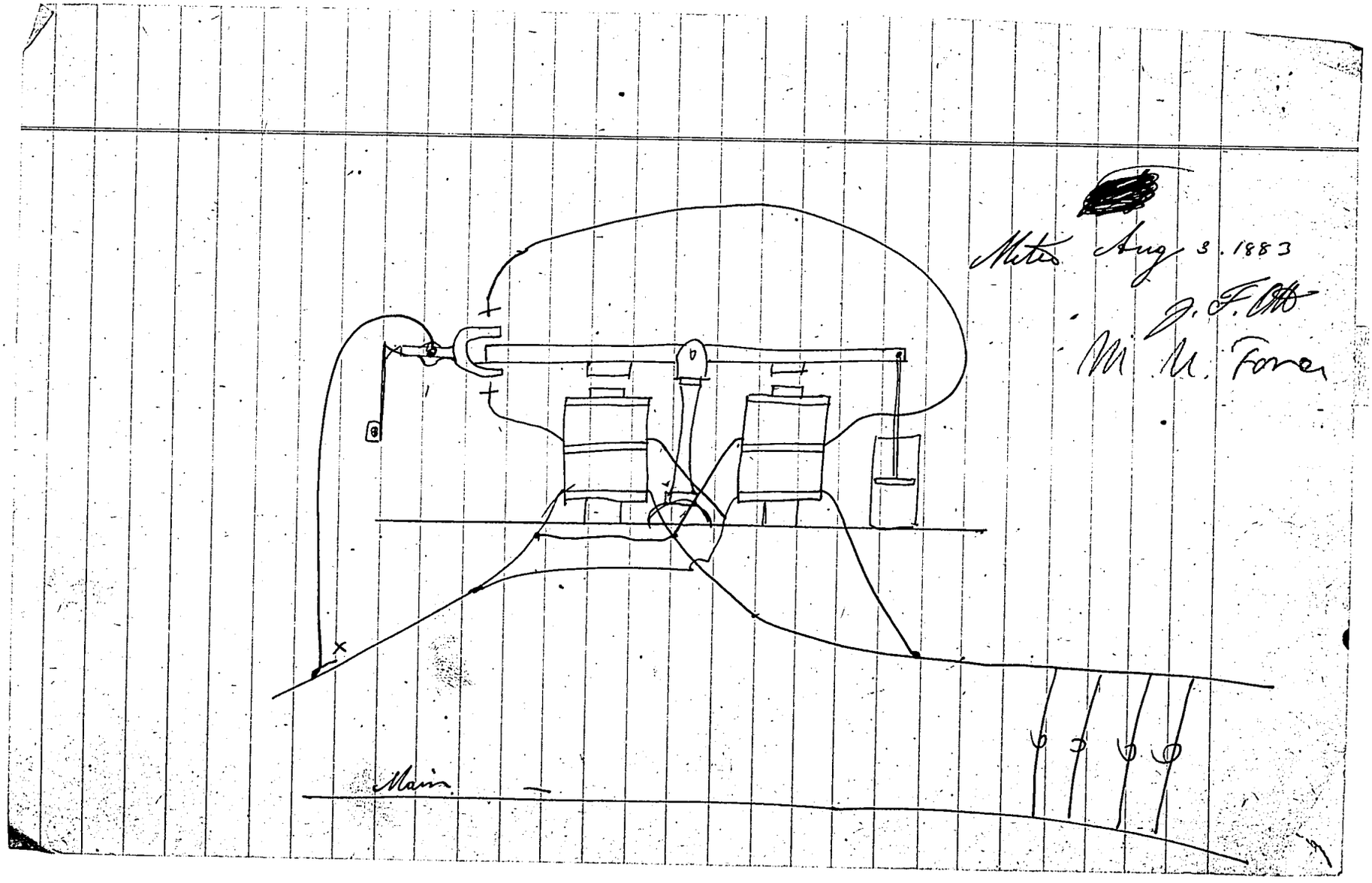
cloth on drum
Moistened with Ink

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK

NEW YORK

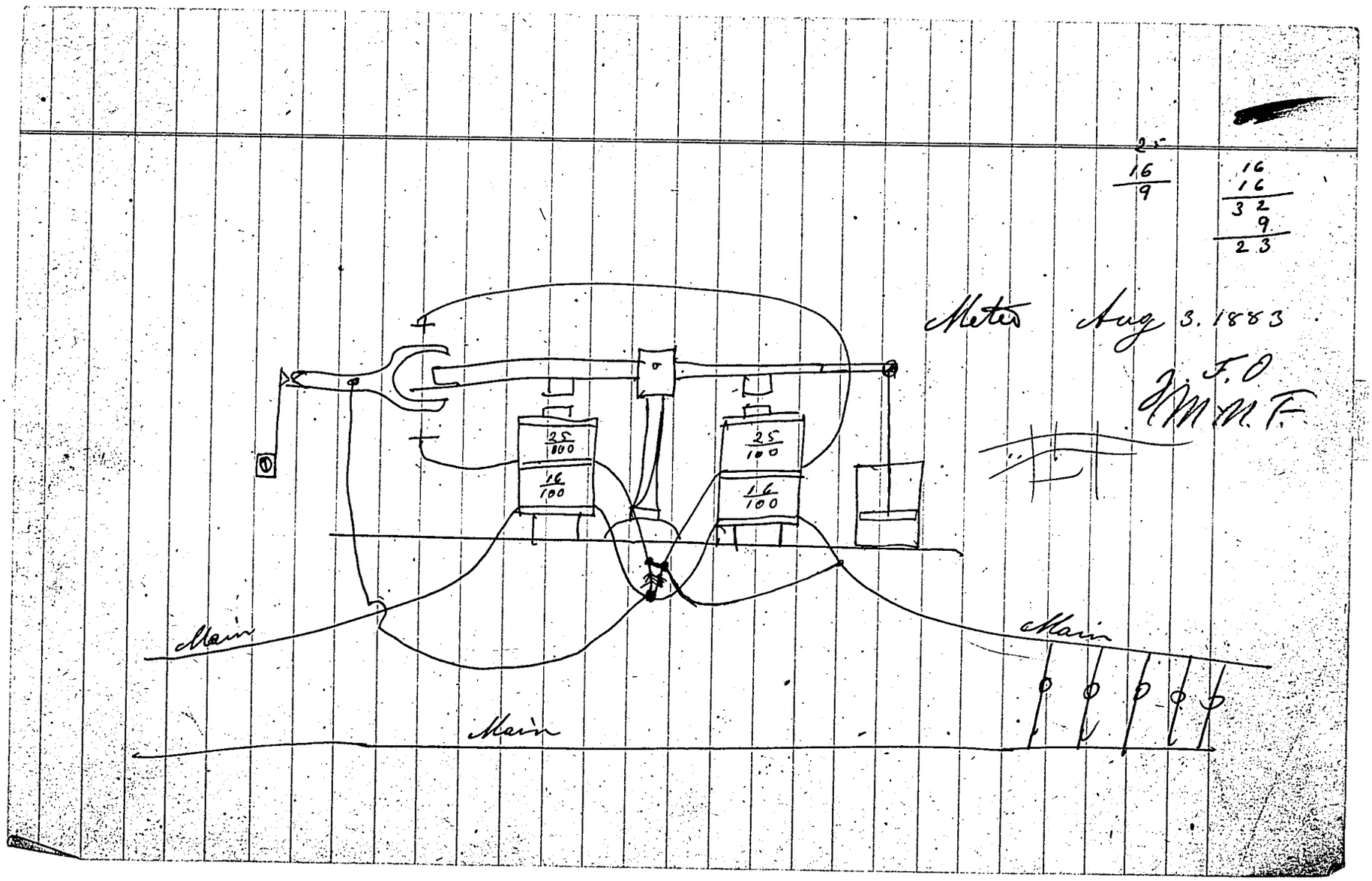
For S. S.



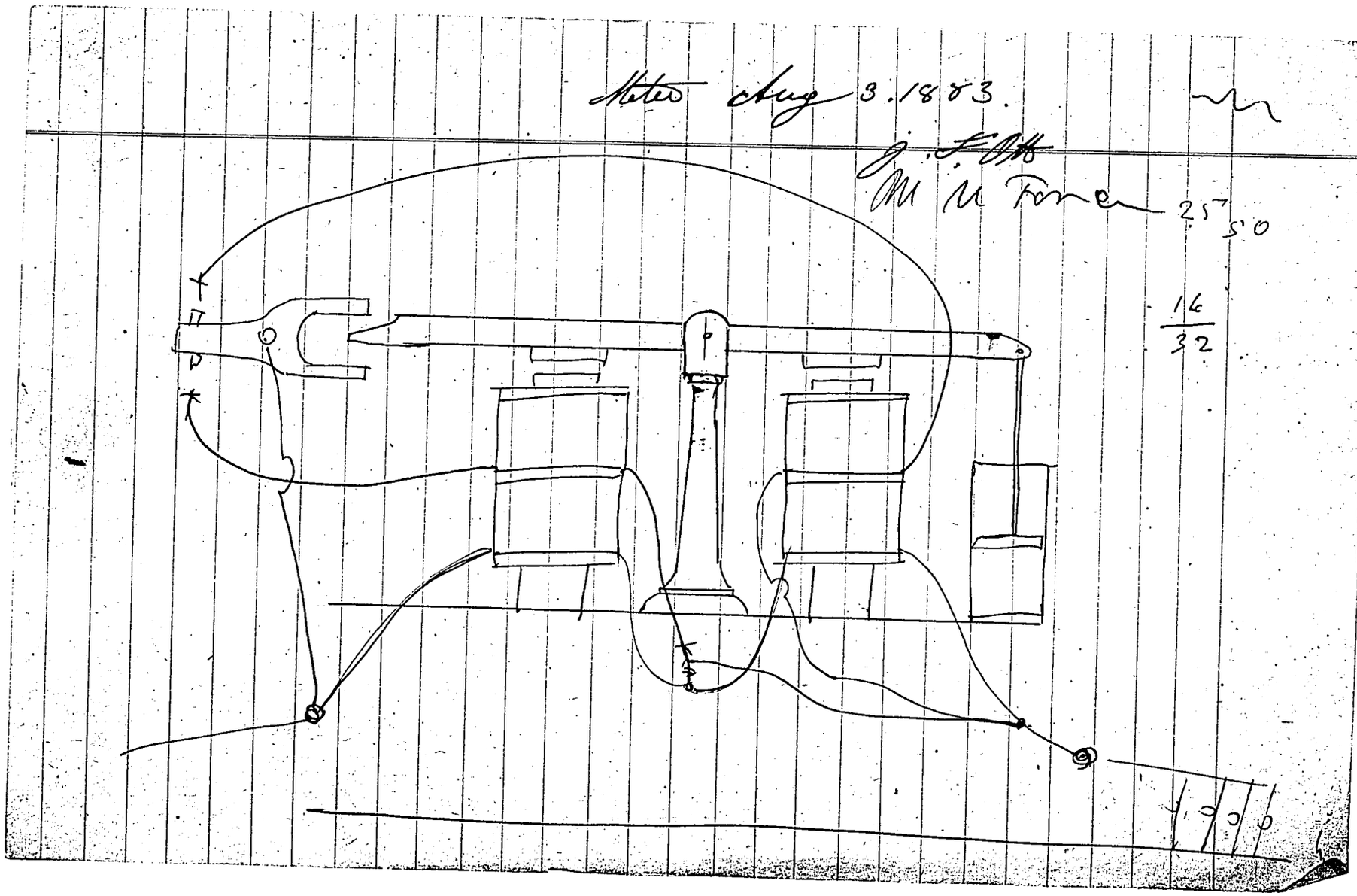

Mitis Aug 3. 1883

J. F. Obb

M. M. Foran


16/9
16
16
32
9
23
Meter Aug 3. 1883
J. F. O
J. M. F.
25/100
16/100
25/100
16/100
Main
Main
Main

Notes Aug 3. 1883.



| Lampe | Zeit | Rev | Diff |
|---|---|---|---|
| 30 | 1 minut | 29 | > 4 |
| 25 | 1 | 25 | > 4 ½ |
| 20 | 1 | 20 ½ | > 5 |
| 15 | 1 | 15 ½ | > 5 ½ |
| 10 | 1 | 10 | > 5 |
| 5 | 1 | 5 | > 1 ⅓ |
| 4 | 1 | 3 ⅔ | > 1 |
| 3 | 1 | 2 ⅔ | > 1 ¼ |
| 2 | 1 | 1 ½ | |
| 1 | 1 | Sticks | |
| 1 | 1 | Sticks | |
| 2 | 1 | 1 ½ | > |
| 3 | 1 | 2 ⅓ | |
| 4 | 1 | 3 ⅔ | |
| 5 | 1 | 4 ¾ | |
| 10 | 1 | 10 ½ | |
| 15 | 1 | 16 | |
| 20 | 1 | 22 | |
| 25 | 1 | 27 ½ | |
| 30 | 1 | 33 | |

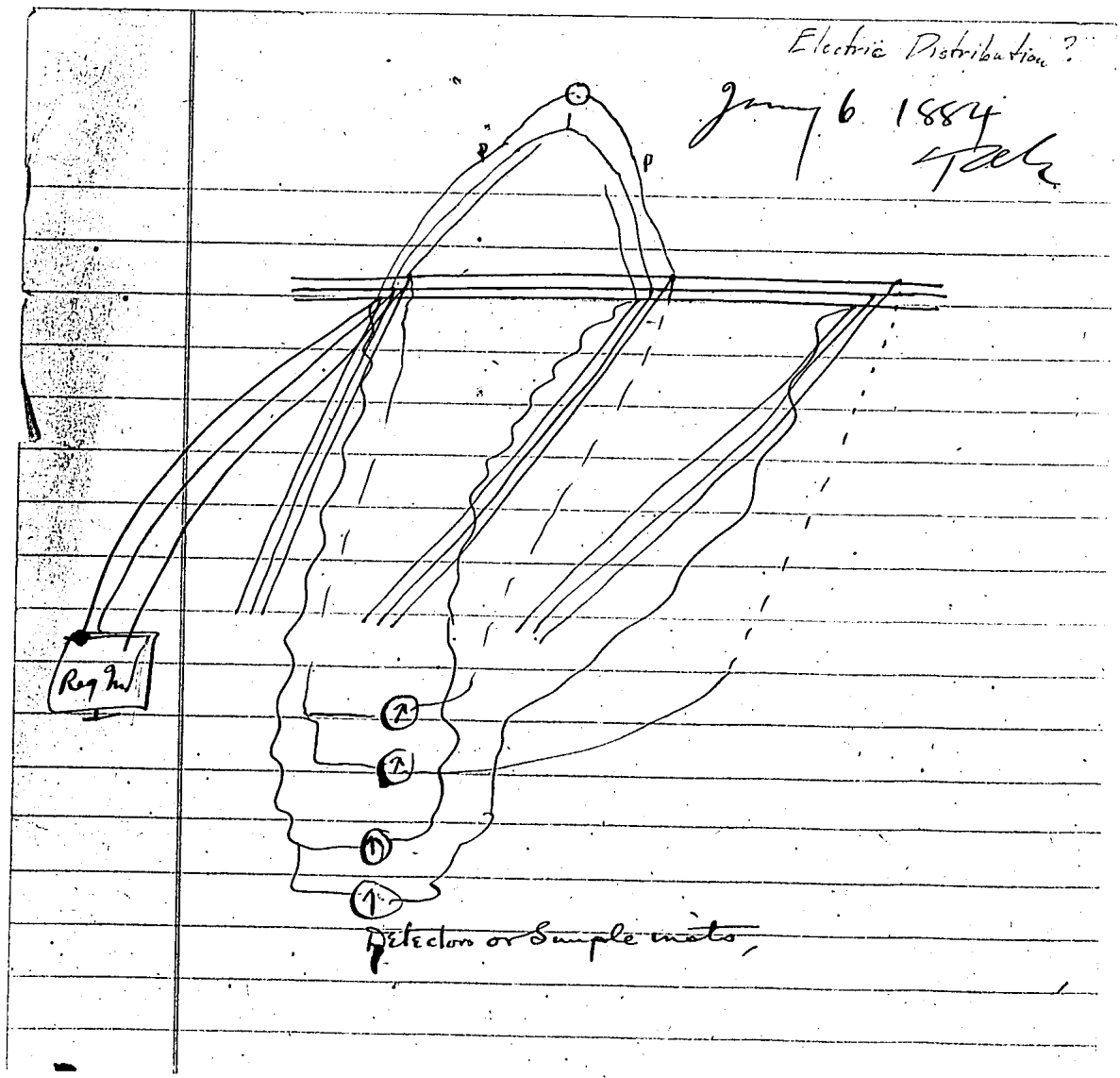
Aug 8. 1883

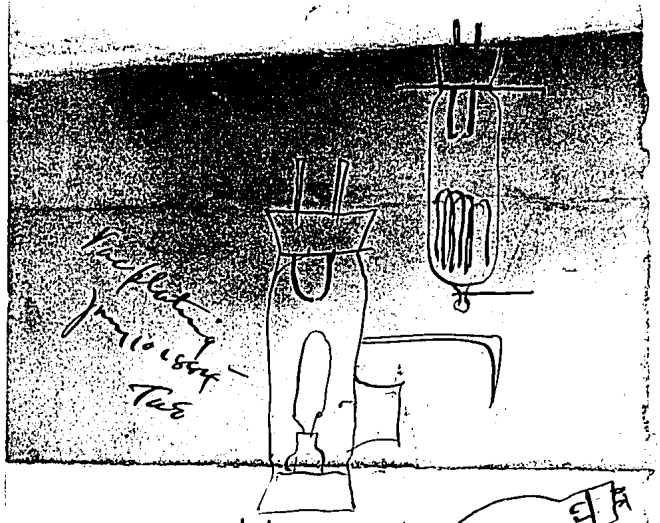
J. F. [illegible]

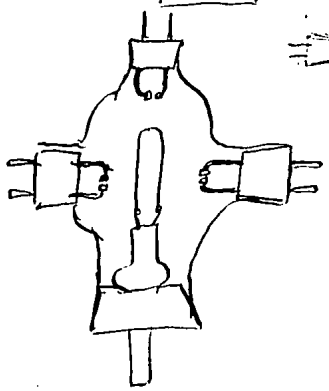
M. U. Farmer

# UNBOUND NOTES AND DRAWINGS

1884


Electric Distribution ?
January 6 1884
P
P
Reg Mr
A
A
A
A
Detectors or Sample mats

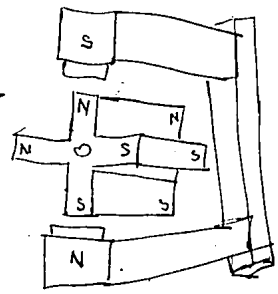


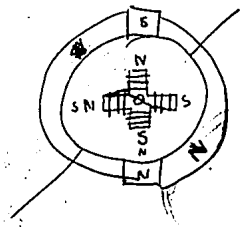


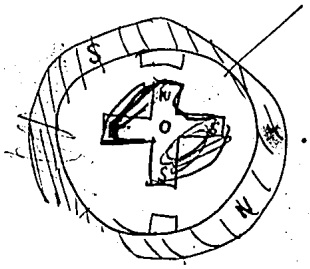
May 3. 84

Ann Miller

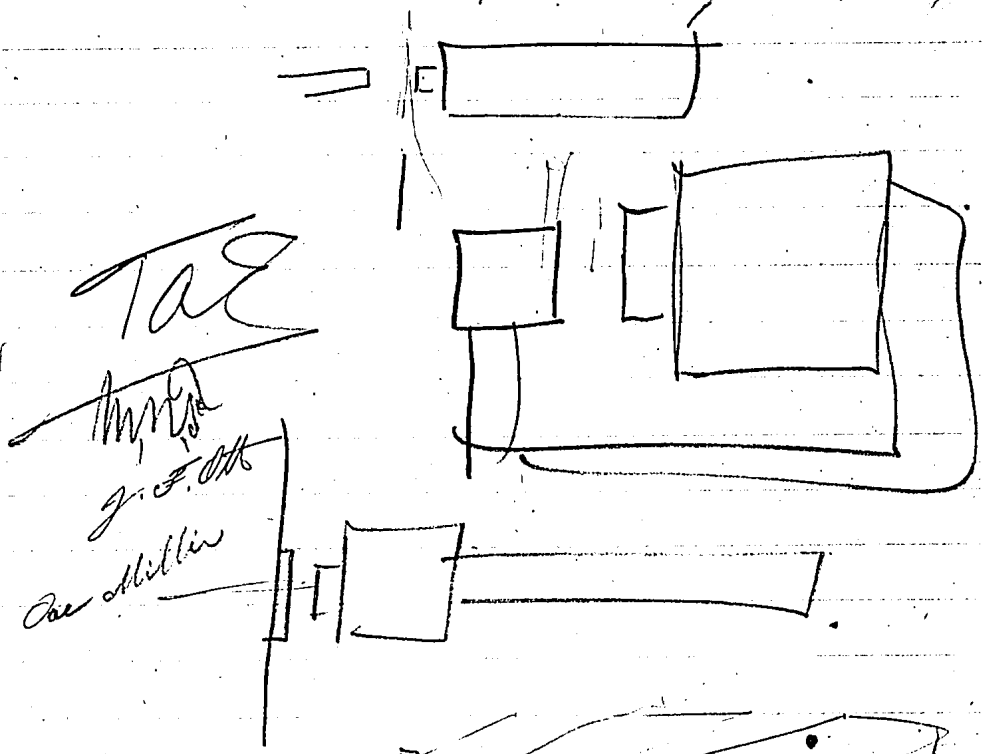
J F Bell



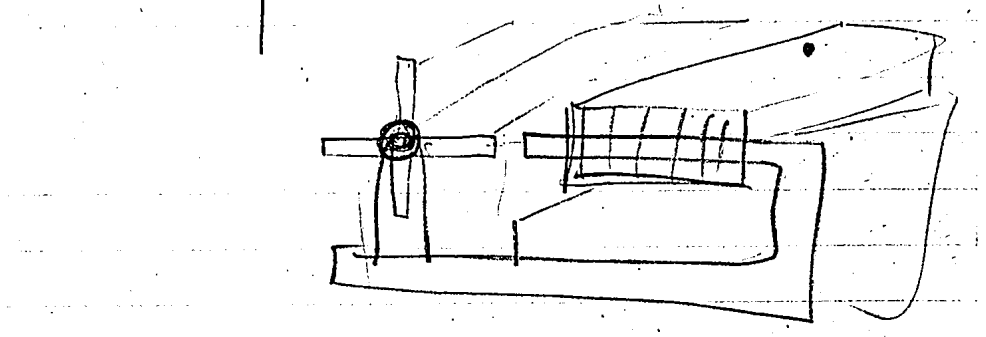



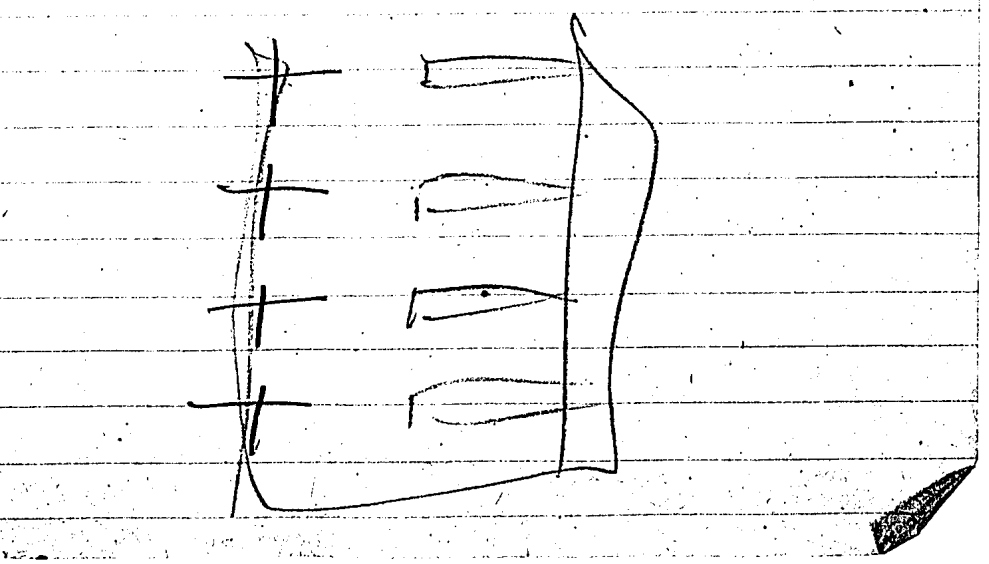



New York May 8, 1854



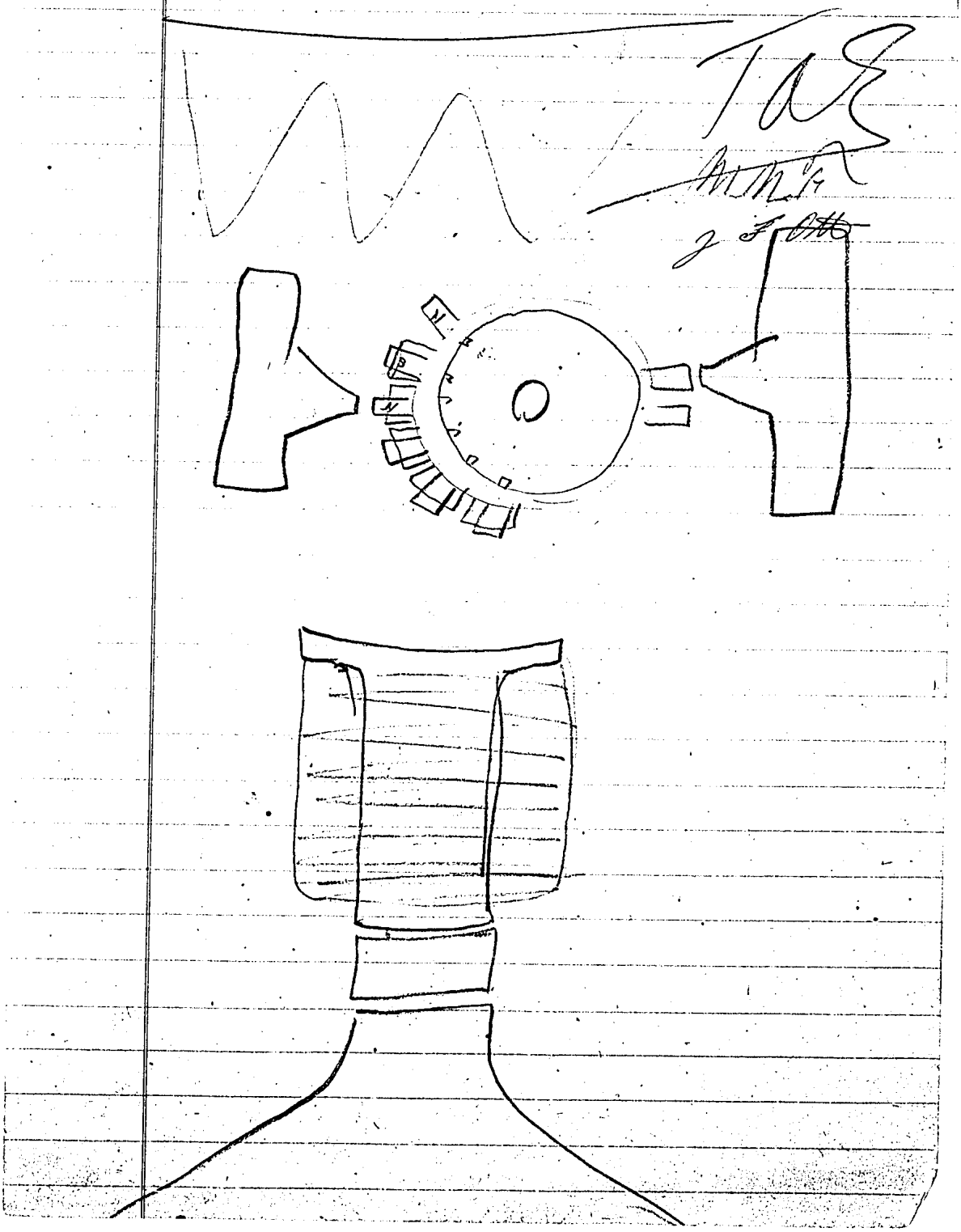


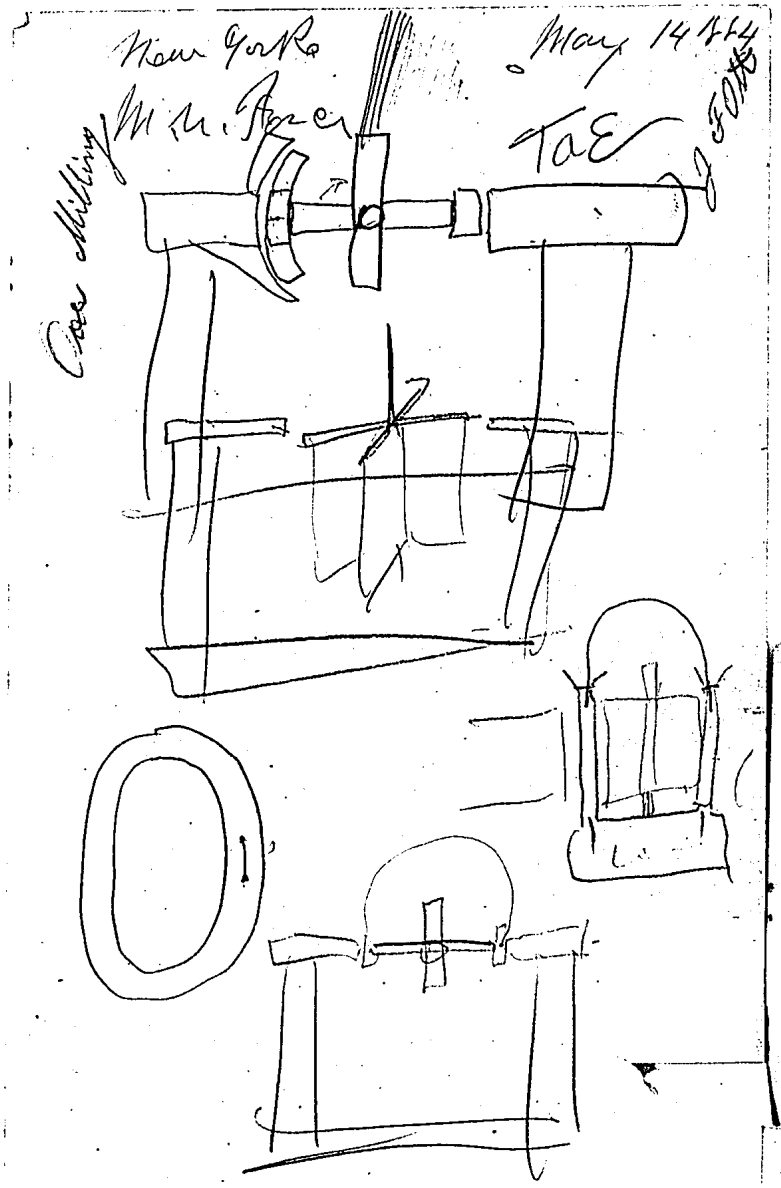


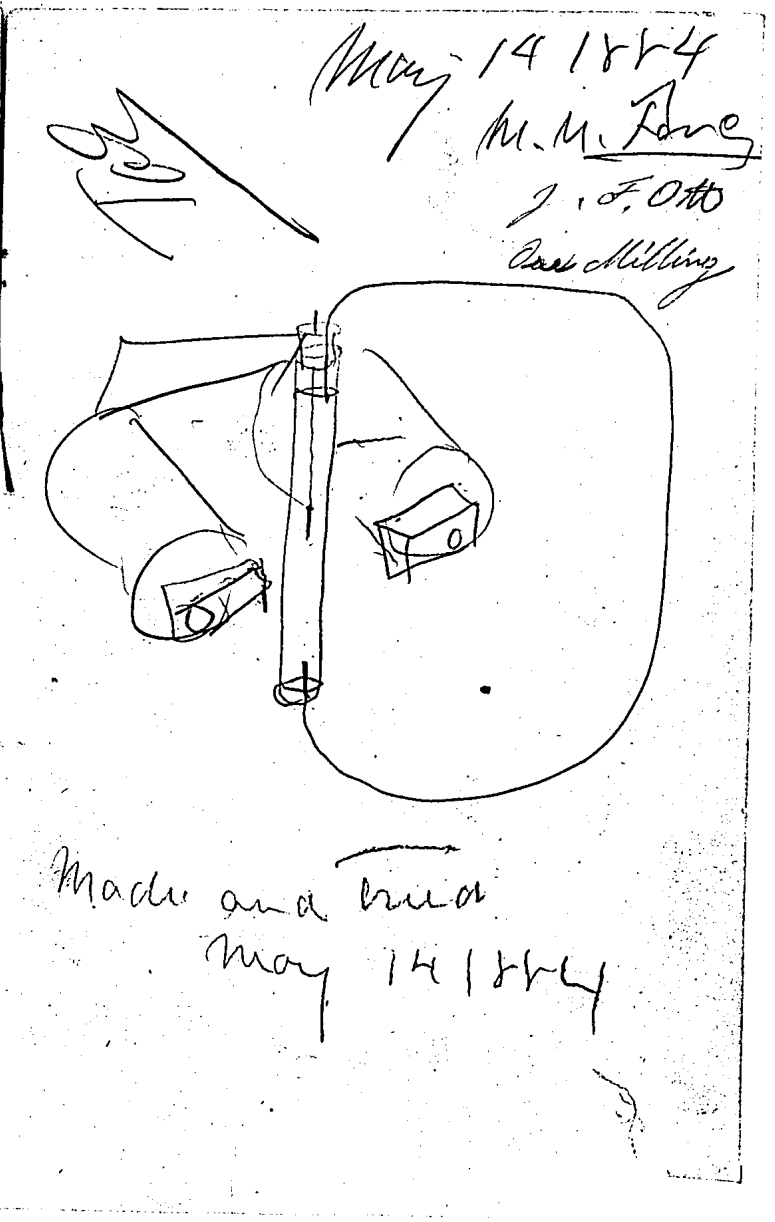


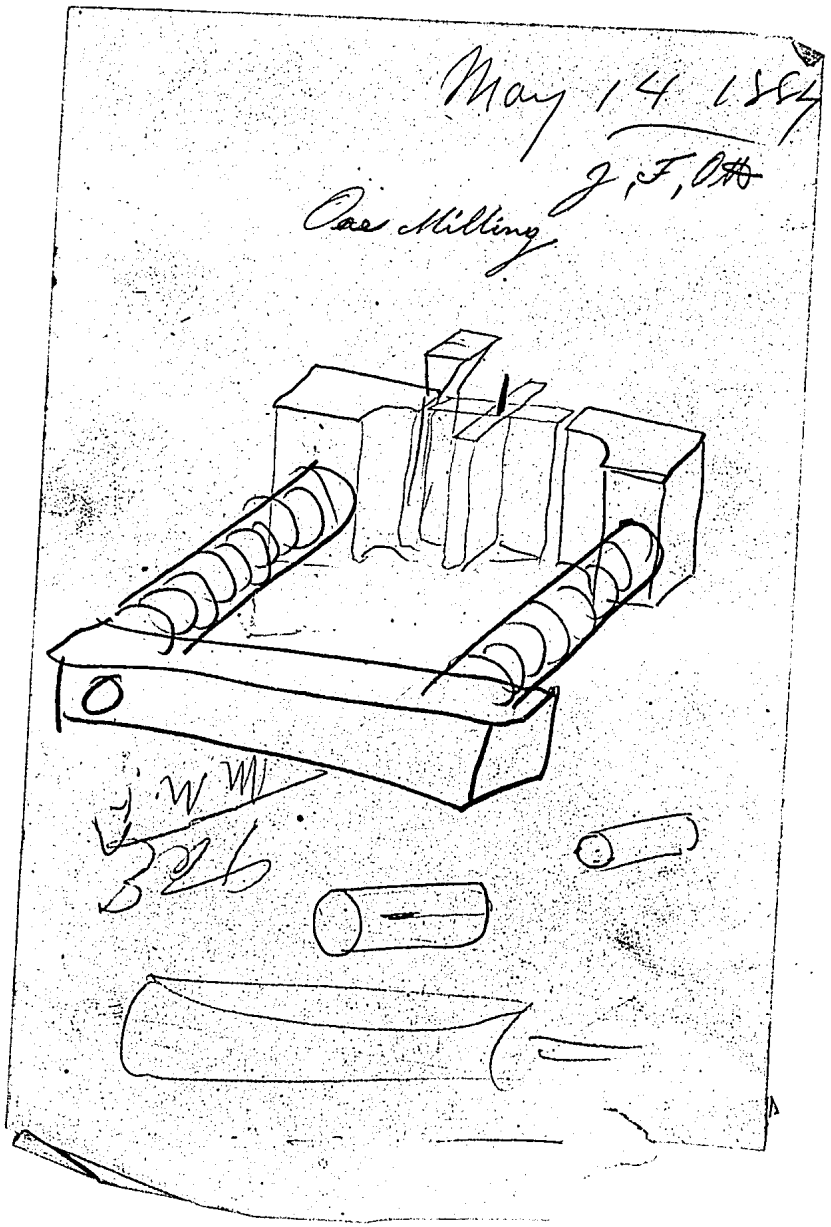
New York May 5th 1854

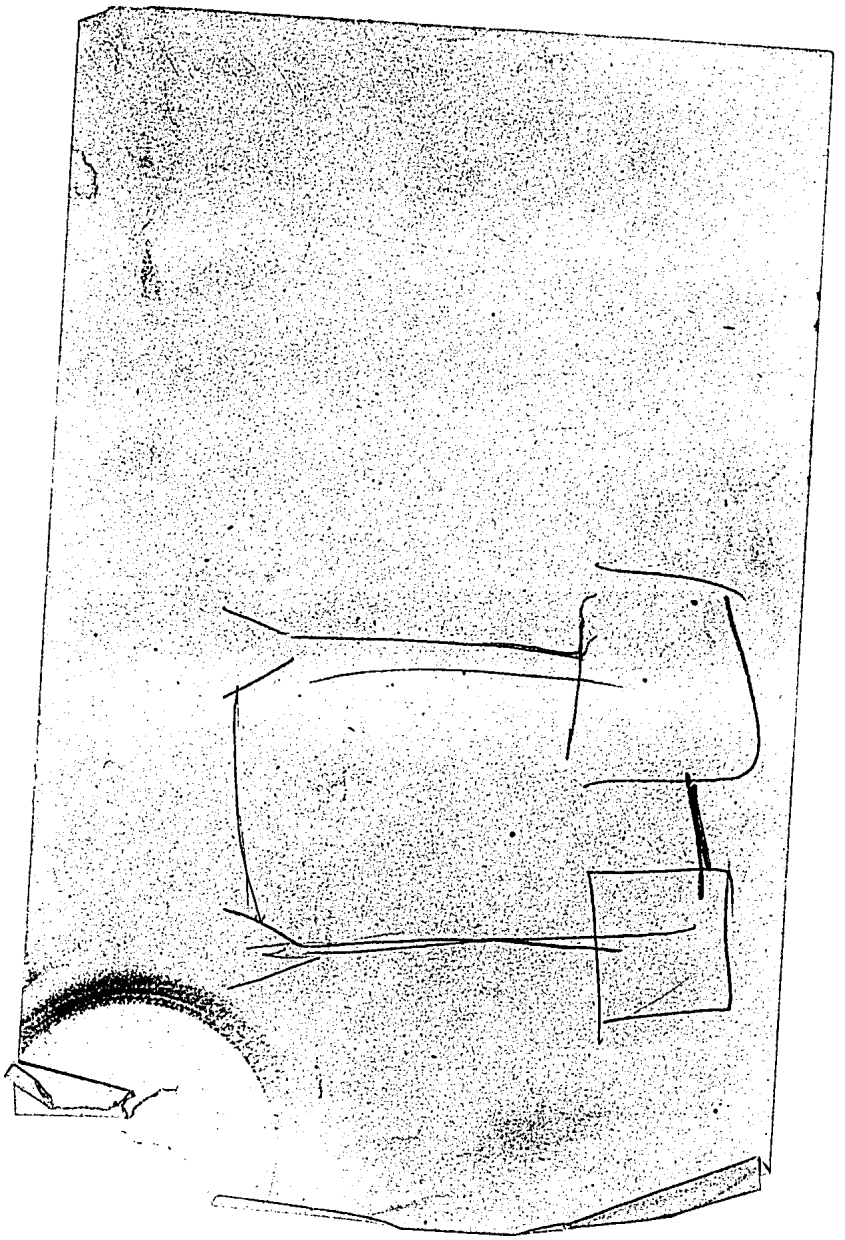
Our Mutilus




New York
May 14 1844
M. M. Ford
T. & E.
J. F. Otto
Case Milling


May 14 1844
M. M. Ford
J. F. Otto
Case Milling
Made and Invented
May 14 1844


May 14 1864
J, F, O
Case Milling

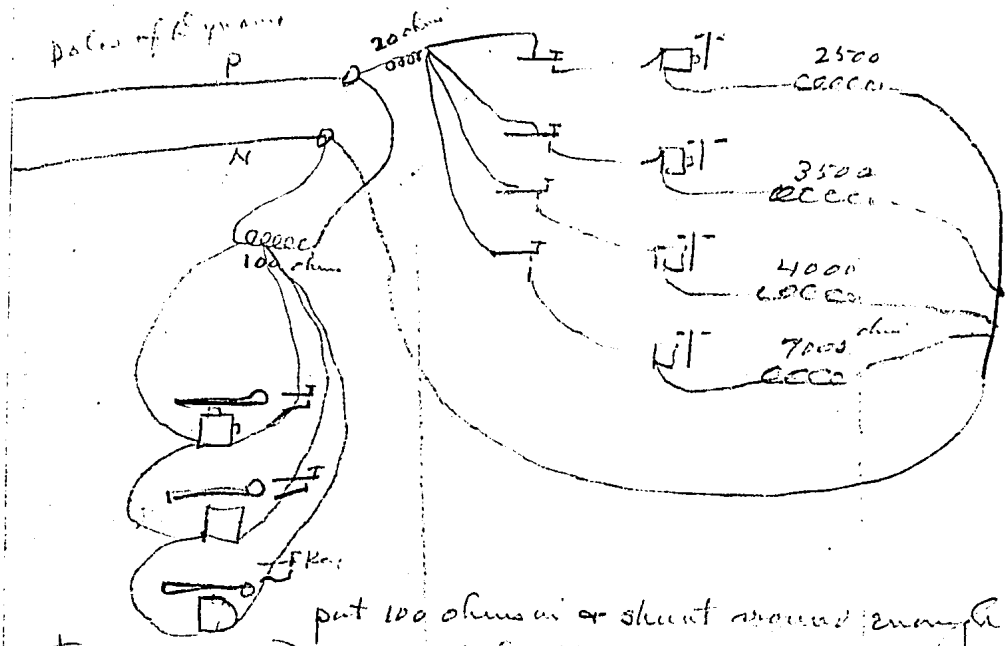


THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK May 22 1884

John Please try the following experiment.

I want to work Local Sounders and also work Telegraph lines of ~~4000~~ 2500 to 7000 ohms Resistance, so arrange it that I can have Local Sounders, ~~&c.~~ Lines Sent individually with Each & Other.



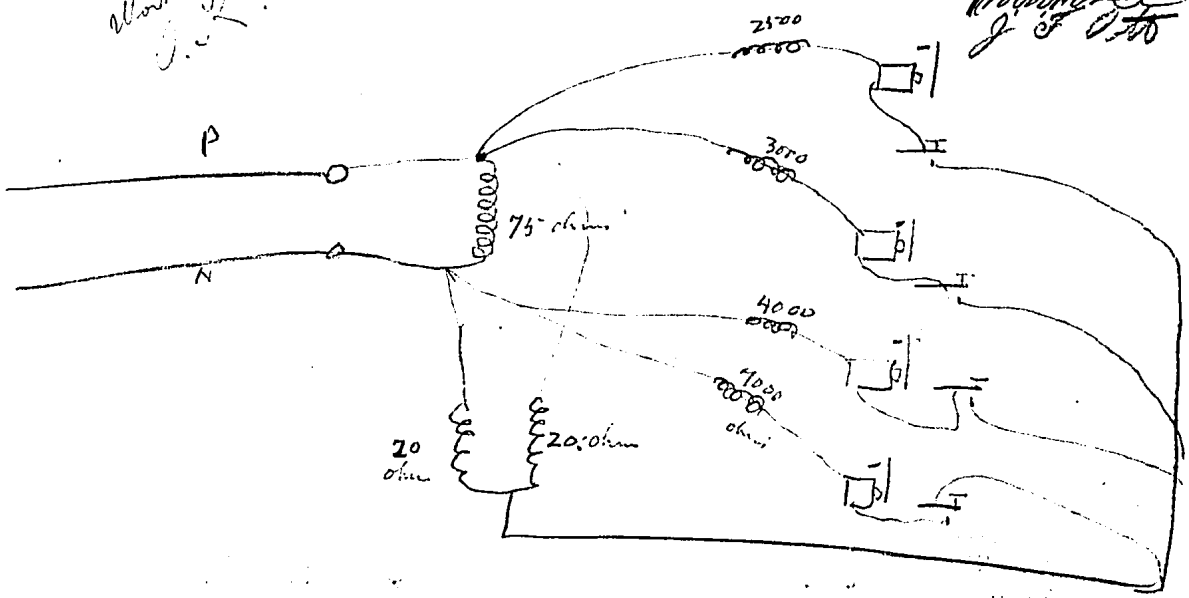

put 100 ohms in or shunt around enough resistance to give good Current to the Sounder then use of the Sounders individually with Each & Other

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

(2)

NEW YORK May 22 1884

Worked J. F. Ott




This is arranged so as to send out positive or negative Currents. The Lines on top of 75 ohm Coil will get Current in one direction while those on bottom of 75 ohm coil will get Current in opposite direction.

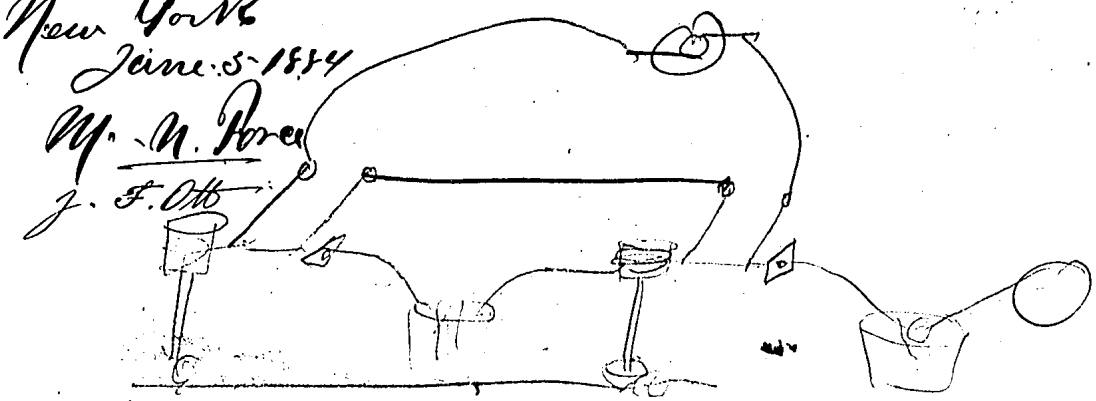
Arranging Collateral Circuits so you can change Relays & Keys Etc from one Experimenter to the other quickly. When Let me know when you are ready to show it to

Edison

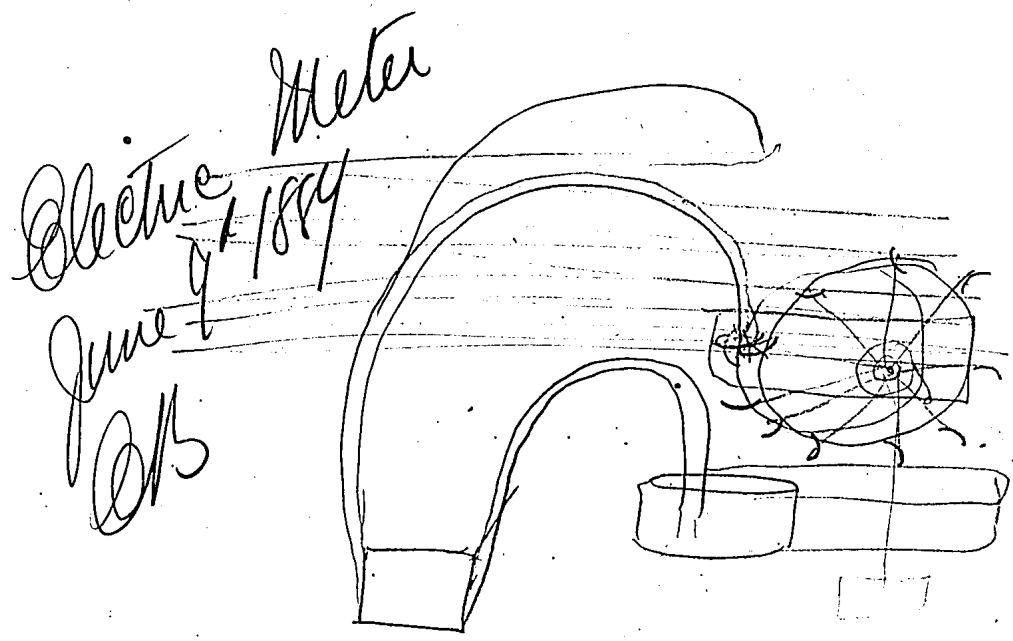
New York
June 5 1884

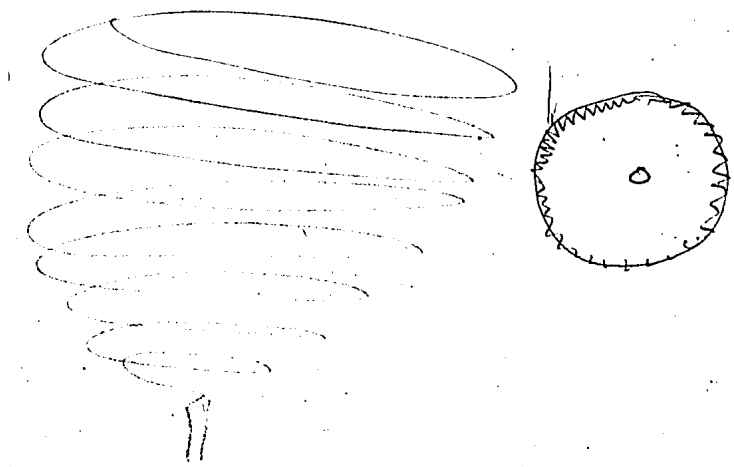
M. A. Ford

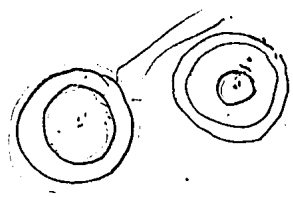
J. F. Otto

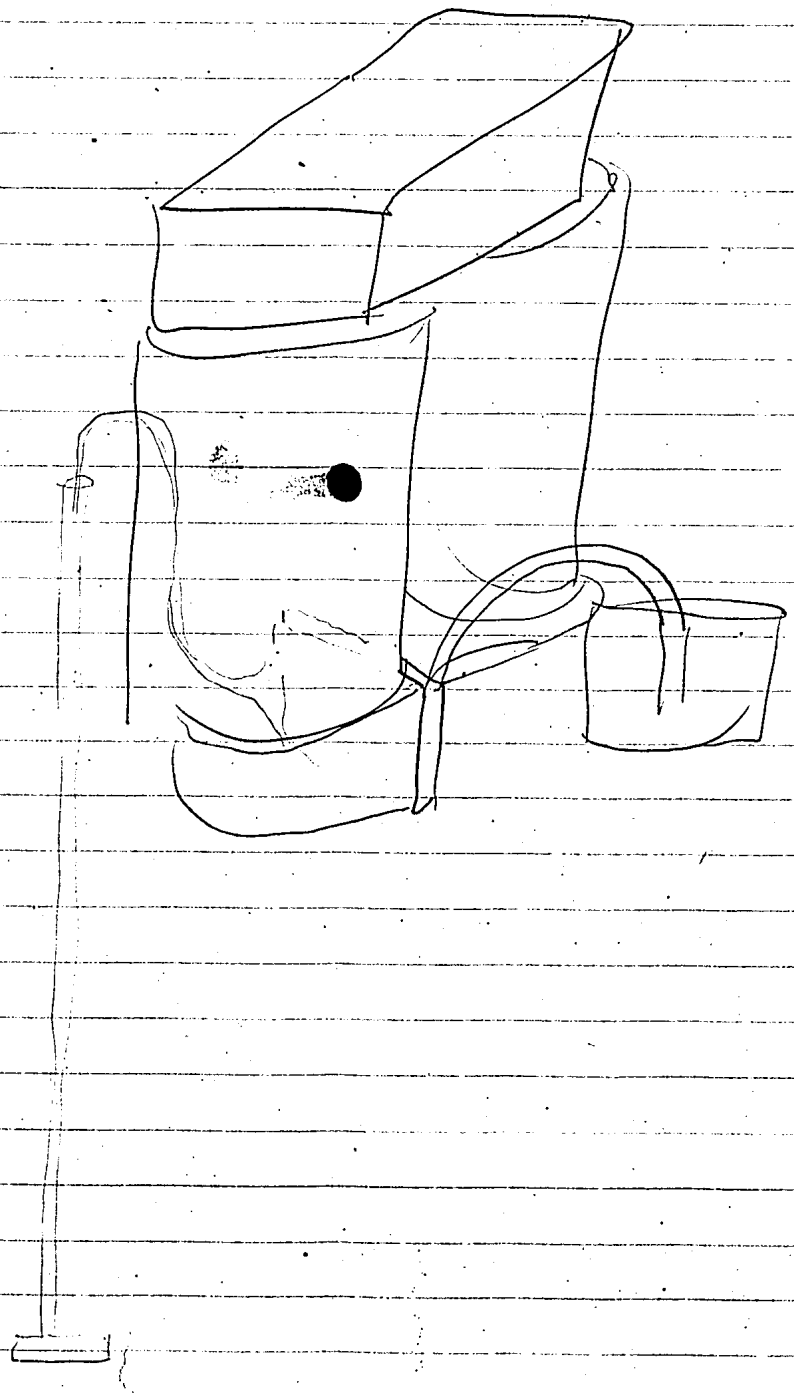


Electric Meter
June 9th 1884

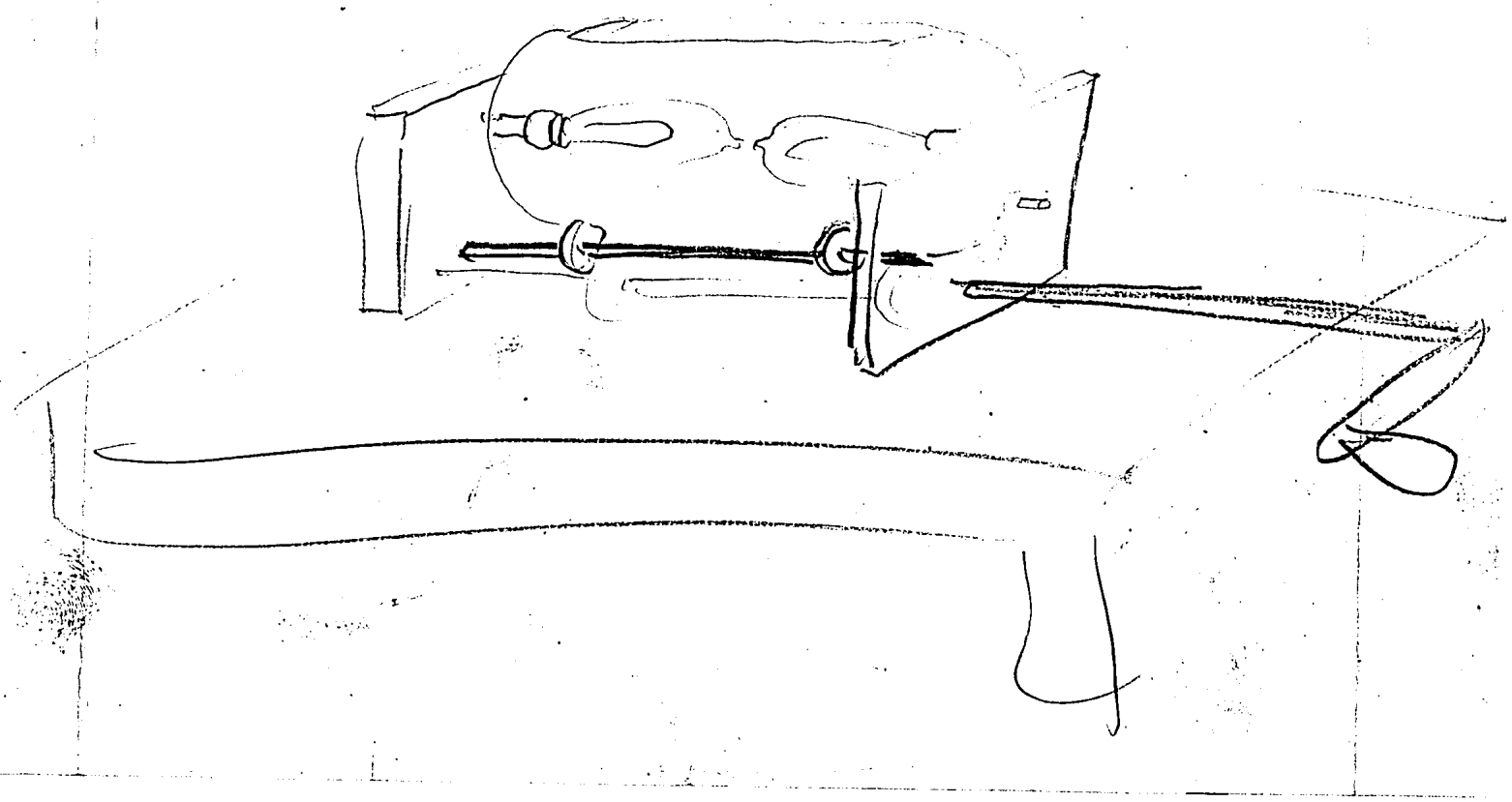








Shot. 13" F.L.

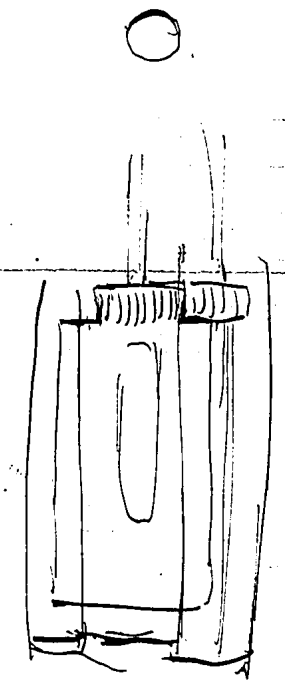


5 2 4
5

4 ) 7 lbs C P Sulphate of Iron.

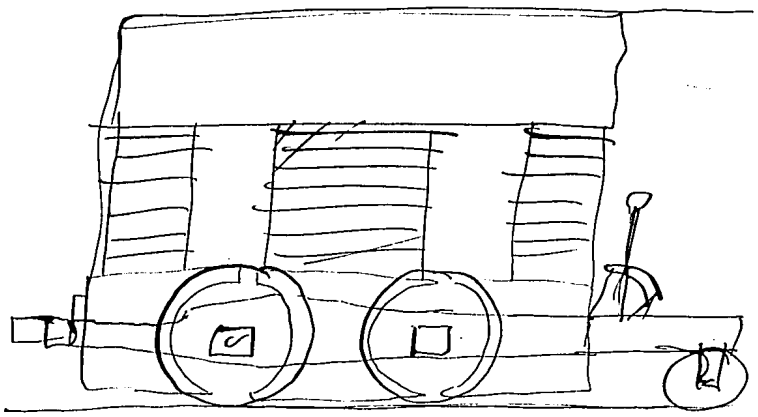
14 s " Ordinary " " "

Sept. .05



THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, .....188



Electric Locomotive,
Nov 24 1884
TAE

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, .....188

Dec 1884
TAE
F. Ott
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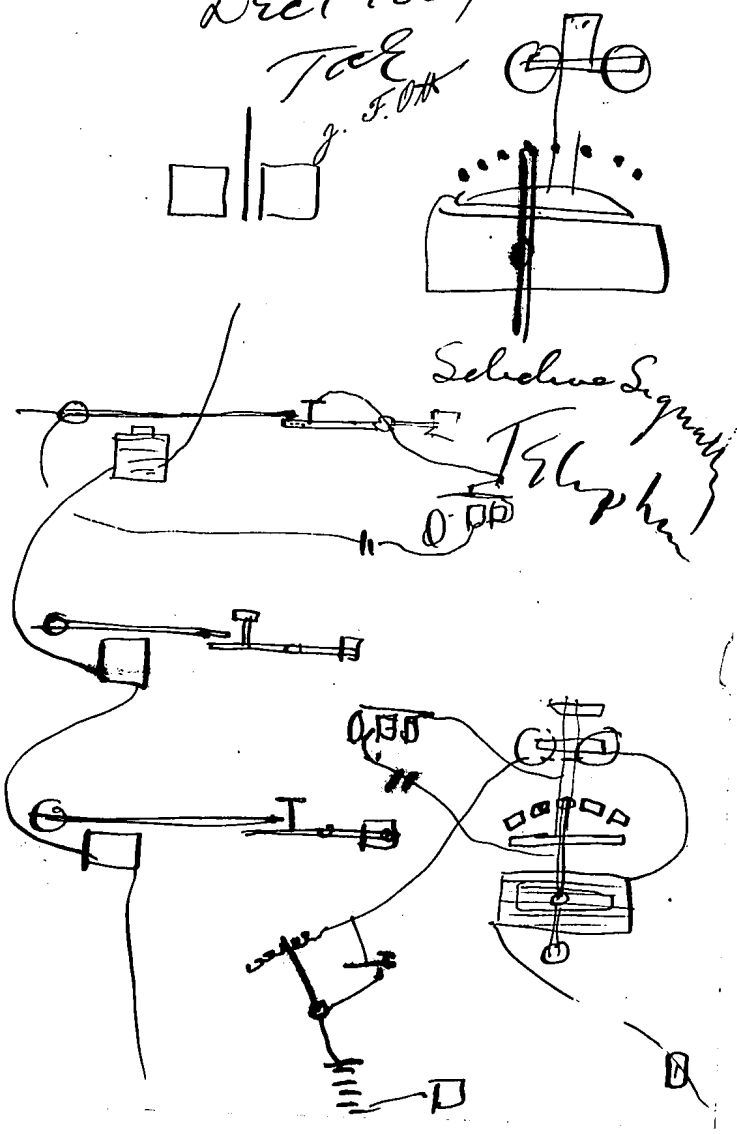
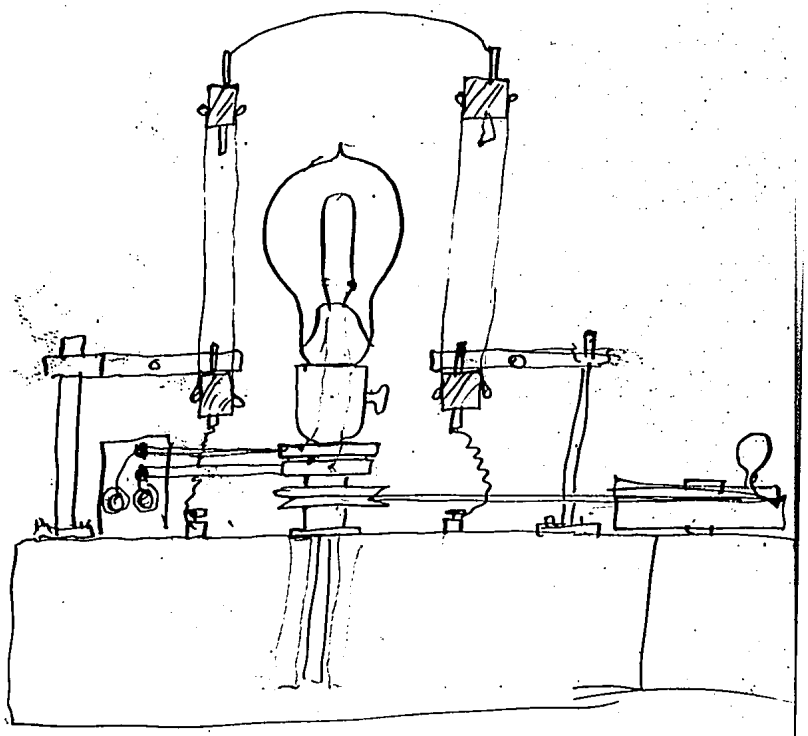


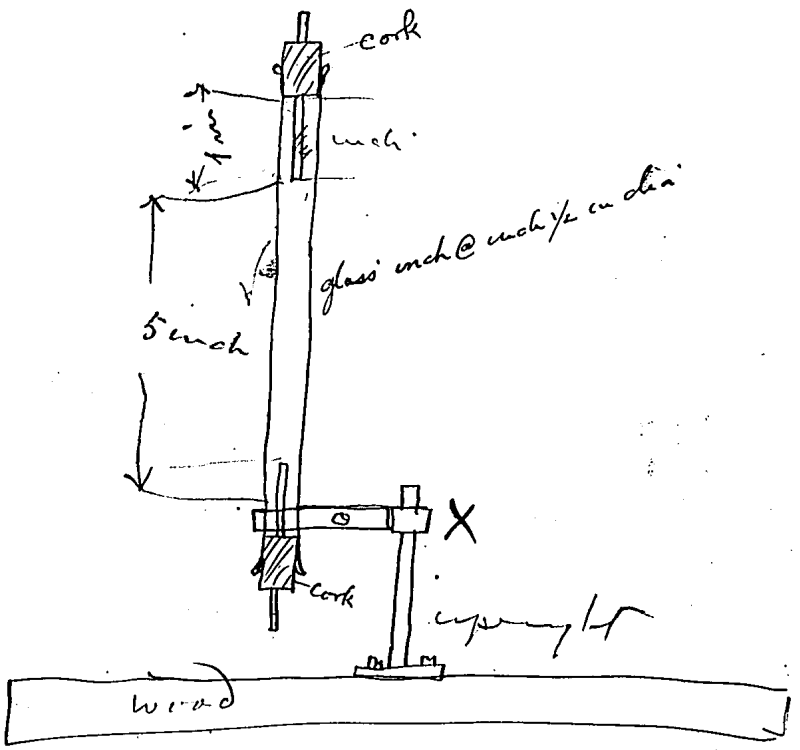
THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

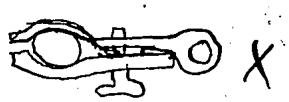
NEW YORK, Dec 1 1884



THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, Dec 1 1884



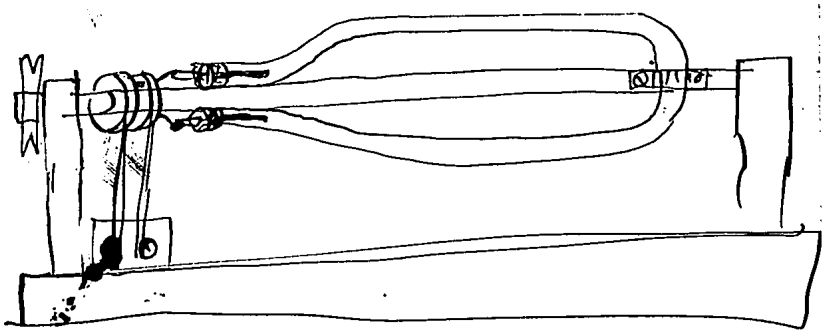



1884-12-01

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, Dec 1 1884

J. F. Otis.



SKETCHING

CABLE ADDRESS—EDISON, NEW YORK.

1884-12-01

Per S. S. .....

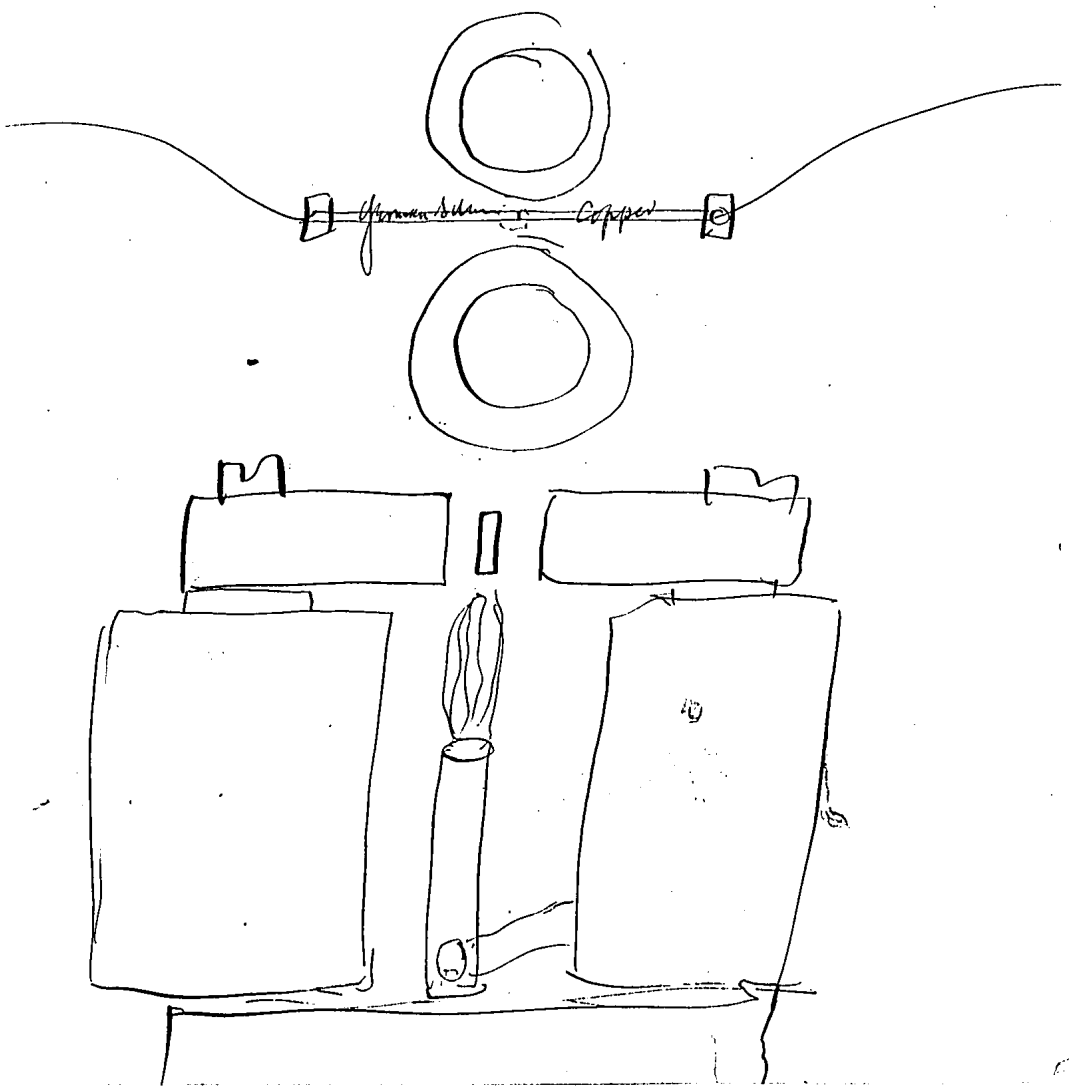
Via .....

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, Dec 1 1884

2 F. 016

Thomas Edison



CABLE ADDRESS—EDISON, NEW YORK.

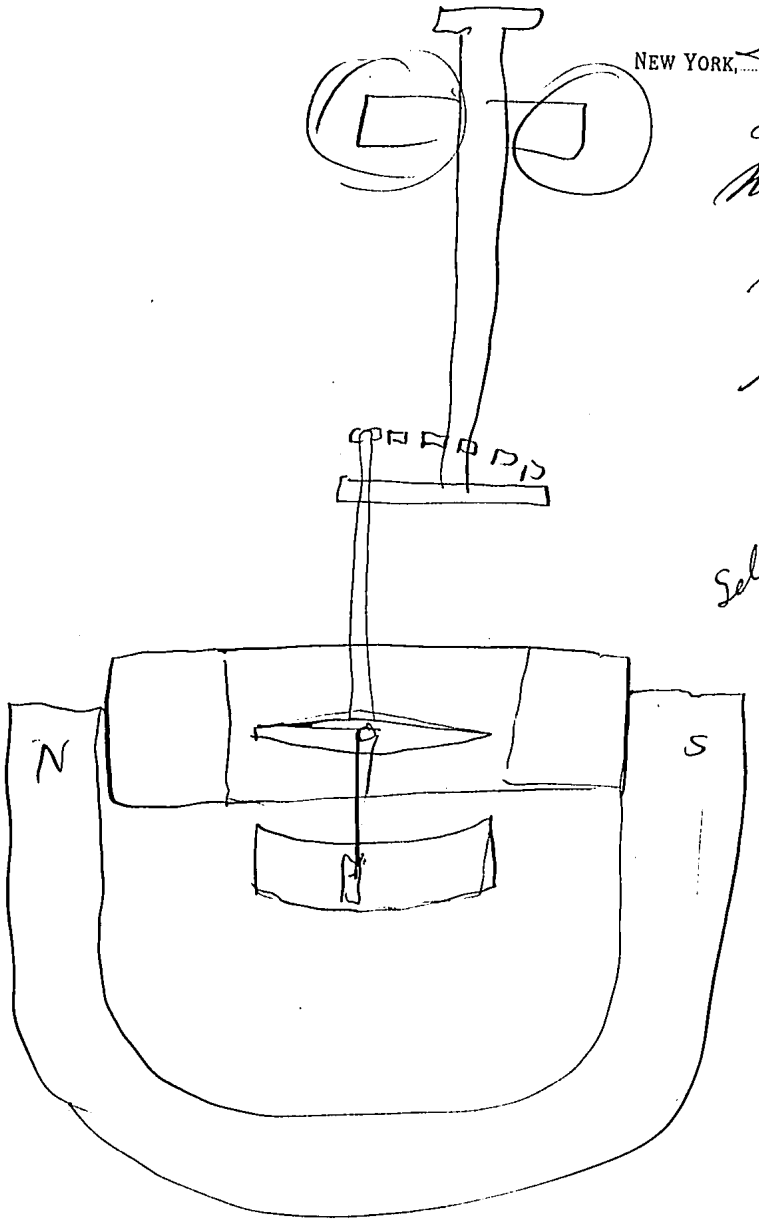
THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

*Per S. S.*.....

*Via*.....

NEW YORK, Dec. 2 188 4

J. F. Ott



UNBOUND NOTES AND DRAWINGS

1885

Number 1
Jan 20 - 1885

Experiment on secondary batteries

ordinary Plantè cell - plates 2" × 3½"
⅛" apart - 3 cells used each consisting of 6 plates - 3 + & 3 -. $H_2SO_4$ of 10%

Cells charged in multiple arc in series with 3 - 16 c.p. lamps also in multiple arc at dull red.

Action gradual - plates looked uniform.

Charged for 2 hours and then discharged through lamp of 1 c.p. requiring about 4 volts to bring it up to candle power. (cells in series)

The lamp was very bright for an instant - then fell to dull red and went out in 2 minutes

Recharged in series and in opposite direction for 2 hours at about same rate as before.

Lamp was very bright for 3 minutes - dull red for 2 minutes and then went out

Plates were alternately + & -.

Also tried the following arrangement
For the positive a stick of dense carbon and the negative a cylinder of perforated zinc.
The solution is composed of
½ Sat. Sol sulphate of Zinc
½ " " " " Manganese.

Charged for 4 hours with current from 2-16 c.p. lamps (in multiple arc) 3 cells in series.

Lamp used in discharge same as before - dull red for 30 minutes.

Battery appears fairly constant but I think internal resistance too high - carbon should be more porous to allow more surface for the oxide of manganese to form.

Jan 31
Recharged lead battery with one lamp at about 12 c.p. in series (cells 3 in series).

After 2 hours charge, ran lamp for 5 minutes - very bright at first but fell rapidly.

Tried 2 cells lead battery in series. Charged ab 3/4 hour and ran lamp bright red for 5 minutes.

Experiment on porosity of different special carbons.
Samples soaked in water for 48 hours and again of weight taken.

½ Sago
Before = 53.000 Gms
after = 112.000 "
Gain % = 112

2 Wheat Flour
Before = 30.000 "
after = 63.000 "
Gain % = 110

3 White Indian Meal
Before = 45.000 "
after = 92.000
Gain % = 104½

4 Rye Flour
Before = 33.000 "
after = 56.000 "
Gain % = 69½

5 Yellow Indian Meal
Before = 15.000 Gms
After = 26.000 "
Gain o/o = 73 7/10

6 Coffee
Before = 1.500 "
After = 3.000 "
Gain o/o = 100

7 Buckwheat
Before = 27.000 "
After = 55.000 "
Gain o/o = 103 7/10

8 Oat Meal
Before = 44.000 "
After = 75.000 "
Gain o/o = 70 1/2

Feb 2.
Recharged lead battery 1 hr 4 hours - ran fairly for 5 minutes

Tried battery of Zinc and Copper plates in Iodide of Potassium but it does not form a success.

Iodide of Copper forms on Copper plate and is dissolved by Potassium Iodide.
From this the Copper is reduced by the Zinc plate leaving Zinc Iodide in the solution from which the Zinc is at once precipitated by Potassium salt.

Copper & Zinc plates in solution of Iodide of Zinc gave good result on a very rough test.

Feb. 3.
Made battery on this principle with same arrangement of plates as lead battery.
Very slight current must be used in charging or else Zinc comes down too fast and both falls away and short circuits the plates.

After 2 hours charge - ran lamp good red heat for 10 minutes and kept it perceptably red for 30.

Appears to be improved by addition of Zinc sulphate.

E. M. F is good and resistance low but keeps getting short circuited by shoots of metal from zinc plate.

Feb 4.

Made battery of zinc-carbon in zinc & Manganese sulphate.

Carbon was a rod of dense carbon in flannel bag surrounded by fine charcoal.

Is not good for any thing.

Made zinc-sulphur in zinc sodide with flannel bitumen plate in order to prevent short circuits but found the metal crept through it

Feb 5.

In zinc-carbon battery replaced carbon by lead cylinder perforated and full of spongy lead.

Poor result - probably too much local action in spongy lead.

Also replaced carbon stick by stick of carbon surrounded by

pulverized carbonized anthracite and found result about same as with lead electrode.

Tried small battery of plates of Copper and Cadmium in Iodide of Cadmium also sulphate-bromid and mixture of the three - also same acid with acetic.

Result fair but not promising as free Iodine forms.

Repeated experiment with Copper and Zinc in Iodid of Zinc and with acetic. Copper plate in long to allow surface for Iodine to act.

Very good result on rough experiment.

Charged with one cell for 30 minutes gave constant 2 M.A. for 15 minutes, then fell and again remained constant for 10 minutes and then was used up.

In solution of sulphate of Zinc and Manganese, tried the following.

№ 1 = Plate of Zinc & Carbon
" 2 = " Zinc and Zinc and Manganese oxide
" 3 = " " & porous cup of fine Carbon
" 4 = " " & Lead
" 5 = " " & Tin
" 6 = " " & Iron
" 7 = " " & Cadmium
" 8 = " " & Copper
" 9 = " " & porous cup of fine carbon
" 10 = " " & Antimony
" 11 = " " & porous cup of red Lead
" 12 = " " & Brass.

Charged for 1 hour in series,
Discharge

| | | | |
|---|---|---|---|
| № 1 = | 150 | № 7 = | 0 |
| " 2 = | 0 | " 8 = | 100 |
| " 3 = | 0 | " 9 = | 100 |
| " 4 = | 25 | " 10 = | 35 |
| " 5 = | 15 | " 11 = | 15 |
| " 6 = | 15 | " 12 = | 140 |

№ 1 & 9 lasted 30 minutes
" 8 & 12 " 5 "

With same solution also tried,

Plate of Zinc & porous cup of plumbago.
action fair

Plate of Zinc and porous cup of oxide of Iron (magnetic)
good action but falls away rapidly

Plate of Zinc and Platinum.
Very strong action for an instant;

bhanged following in series.
№ 1 = Salivalid Jodide of Zinc
" 2 = Do Lule " " "
" 3 = Salivalid " " + acetic acid
" 4 = Do Lule " " " " " "
" 5 = Jodide + Sulphate Zinc + Sulph Manganese
" 6 = Jodide Zinc + acetate of Cobalt
" 7 = acetate of Zinc
" 8 = " " " + Jodide of Zinc
" 9 = Sulph Aluminium, Jodide Zinc + acetic acid
" 10 = Jodide Zinc + alcohol
" 11 = " " + Sulphate Cadmium
" 12 = " " + Iron Ammonium Citrate

Deflections after 30 minutes change

| | |
|---|---|
| № 1 = 30 | № 7 = 10 |
| " 2 = 10 | " 8 = 30 |
| " 3 = 40 | " 9 = 20 |
| " 4 = 10 | " 10 = 10 |
| " 5 -- 60 | " 11 = 25 |
| " 6 = 10 | " 12 = 10 |

Made large battery with Zinc + Copper plates with Solution of Jodide of Zinc - Sulphate of Zinc and Sulphate of Manganese.

5 cells of this battery will run the lamp at bright red but the battery has several faults.

The E.M.F is low.

The deposits are not firm and are liable to fall away.

When charged the copper plate becomes coated with a white deposit probably Iodide of Copper.

In discharge, this is not entirely reduced and a black coat of Iodide remains. After one or two charges this cracks and falls off spoiling the solution.

Third plate of
Zinc + Lead in Iodide of Lead
Copper " " " " " "
Zinc " Iron " " " Iron
Copper " " " " " "

Results very poor and the Iron solution very nasty to handle.

Made large battery for practical test of Iodide Solutions.

Battery consisted of large flattened cylinder of Sheet Copper in centre of which was suspended a plate of perforated amalgamated Zinc

The Copper plate was coated with electro deposited copper to give sponge surface.

Solution

½ Sulphate of Zinc saturated
½ Iodide " " "

slightly acid with acetic acid.

Charged 5 cells in series for 4 hours.

Brought lamp to bright red for 30 minutes and then fell off rapidly

Tried special test of small cells as follows.

No 1 solution of Iodide of Zinc
Sulphate " "
" " Manganese

N° 2 Solution of Sulphate of Zinc
" " Manganese.

Copper and Zinc plates used in both.

Discharge after charging 1 hour.
N° 1 50 for an instant
35 " 15 minutes
30 " 2 "
Then fell off, slowly and was entirely discharged in 30 minutes.

N° 2 = 30 for an instant
20 " 10 minutes
at this point the deposit fell off and the action ceased

Tried Zinc + Carbon in Iodide of Zinc but the result is same as free Iodine forms

Tried Copper and Mercury in solution of Zinc Iodide & Sulphate.
Not very promising

Tried same electrodes in sulphate of Copper - No action.

Number 2

Battery composed of two copper plates in acid solution of Zinc iodide gives good E. M. F. at first but is not at all constant. Iodide of copper forms on one plate and metallic Zinc on the other.

There is a slight primary action between copper and Zinc in solution of Iodide of Zinc either neutral, acid or mixed with Sulphate of Zinc, and the copper becomes coated with a black deposit.

Neither Zinc nor Copper alone, caused any deposit.

In order to stop the initial primary action the Zinc was amalgamated but this did not effect the object and made no difference in the final action except that the deposit was made more uniform and less spongy metal formed.

With both the plates amalgamated there is no primary action and the battery will not change at all

Experiment with Copper and Zinc plates in solution consisting of
200 c.c of water - 1 gram Iodide of Zinc, and the following

N° 1 = + Citric acid
" 2 = + Acetic "
" 3 = + 2 grams Sulphate of Zinc & Citric acid
" 4 = + " " " " " & Acetic "
" 5 = + 1 " Chromic acid
" 6 = + Nitrate of Cobalt & Citric "
" 7 = + 1 gram Chromic Sulphate
" 8 = + 1 " Chloride of Cobalt
" 9 = + 1 " Iodide " Cadmium
" 10 = + 1 " Acetate " Cobalt
" 11 = + 1 " Pyrogallic acid
" 12 = + 1 " Sugar

Charged for 45 minutes in series.
Discharged through galvanometer and obtained the following deflections

| | | | |
|---|---|---|---|
| N° 1 = | 30 | N° 7 = | 40 |
| " 2 = | 28 | " 8 = | 50 |
| " 3 = | 50 | " 9 = | 20 |
| " 4 = | 50 | " 10 = | 20 |
| " 5 = | 15 | " 11 = | 10 |
| " 6 = | 40 | " 12 = | 15 |

Number 3.

Tried a battery in which the electrodes were a cylinder of zinc amalgamated and a porous cup filled with bits of carbonized anthracite.

The solution was mixed sulphate of zinc and manganese - half and half - saturated.

Three cells of this in series will run the lamp at good candle power, but when large enough to last for any length of time, weighs too much.

The lead battery first mentioned after repeated charging and discharging and after the plates had been subjected to electrolytic action in a solution of Litharge in caustic soda - ran the lamp at full candle power for 30 minutes, with one hour's charging.

Constructed a battery as follows. In a tube of copper was placed a solution of ½ Iodide of zinc ⅓ sulphate of zinc + ⅙ sulphate of manganese - all saturated.

In this was suspended a rod of amalgamated zinc.

Six cells in series will give about 20 minutes at full candle power with two hours charging.

The object of this experiment was to construct a battery in which the vessel containing the solution should be one of the elements of the battery and this could be done very well as the action is nearly all on the surface of the copper. The battery weighed about five pounds.

Tried battery of copper and zinc plates in solution of caustic Soda. High electromotive force at first, but falls rapidly.

Tried battery of mixed sulphate of zinc and manganese in which the electrodes were a plate of amalgamated zinc and a piece of porous sago Carbon. This gives very fair results

but would have to be quite bulky to run the lamp for several hours.

Summary.

I shall here discuss the three batteries which of all those tried have proved the best and they will be mentioned in the order of their comparative values.

1 ordinary Plante cell.

Plates should be cleaned with sand paper and left 24 hours in very dilute Nitric acid.

Then connected up, washed with clean water and exposed to the action of a strong current in a solution of Litharge in caustic Soda; the direction of the current being several times reversed.

Remove from this and wash to remove all traces of the alkaline solution and then charge in dilute sulphuric acid (about 10 %). Plates must be charged and discharged and recharged with a reverse current 4 or 4.

and the percentage of acid should be from time to time increased till it is about 20.

The object is to have the action strike in as far as possible in order that the plates may take a good charge. The actual result is, that about the time the battery is good for any thing, the plates are ready to fall to pieces. This means that if you would have a good number of lamp hours from the battery you must increase the surface of the plates and this of course means increase of weight.

2 Zinc and Carbon battery.

The best solution for this is

1/2 Sulphate of Zinc saturated.
1/2 " Manganese "

The Zinc should be amalgamated and the Carbon should be porous.

If you attempt to use bits of anthracite or other Carbon they should be packed in a porous

cup rather than a bag as a bag is apt to stretch and allow the plates to separate.

If a porous carbon, as sago, is used the pores are apt to become clogged and for this reason the charging should be as slow as possible.

The carbon is of course the oxygen pole in charging.

Zinc and Copper battery.

Best solution is

1/2 Iodide of Zinc saturated.
1/2 Sulphate " "
1/6 " Manganese "

and a few drops of Nitric or acetic acid.

The Zinc should be amalgamated and the Copper be plated with Copper to secure a spongy surface.

The Copper is the oxygen pole.

The battery must be charged

slowly and is not easy to manage as a slight change in the nature of the solution or too strong a current in charging spoils it.

Free Iodine forms slowly and this wears away the fine platé.

All of the batteries are open to one serious objection.
During the process of charging deposits form on the plates.
A slight shaking causes these deposits to fall away and when this happens the action at once stops and the solution must be renewed and the battery cleaned.

A primary battery will stand any amount of shaking and is indeed improved by it as the evolved gases are prevented from sticking to the electrodes.

Mar 8/85

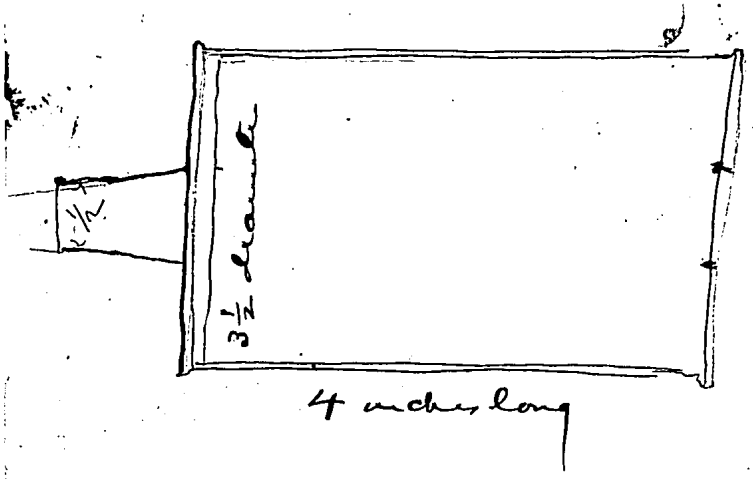
Thomas P. Conant.

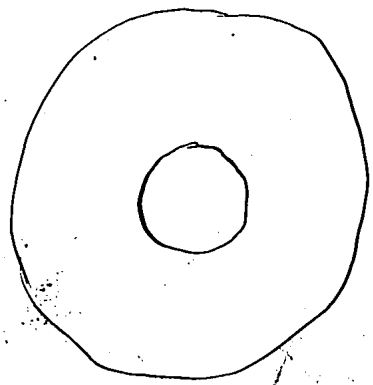
THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,

Form L. 1000-4-21-'84.

New York, July 6 1885

6 of this size

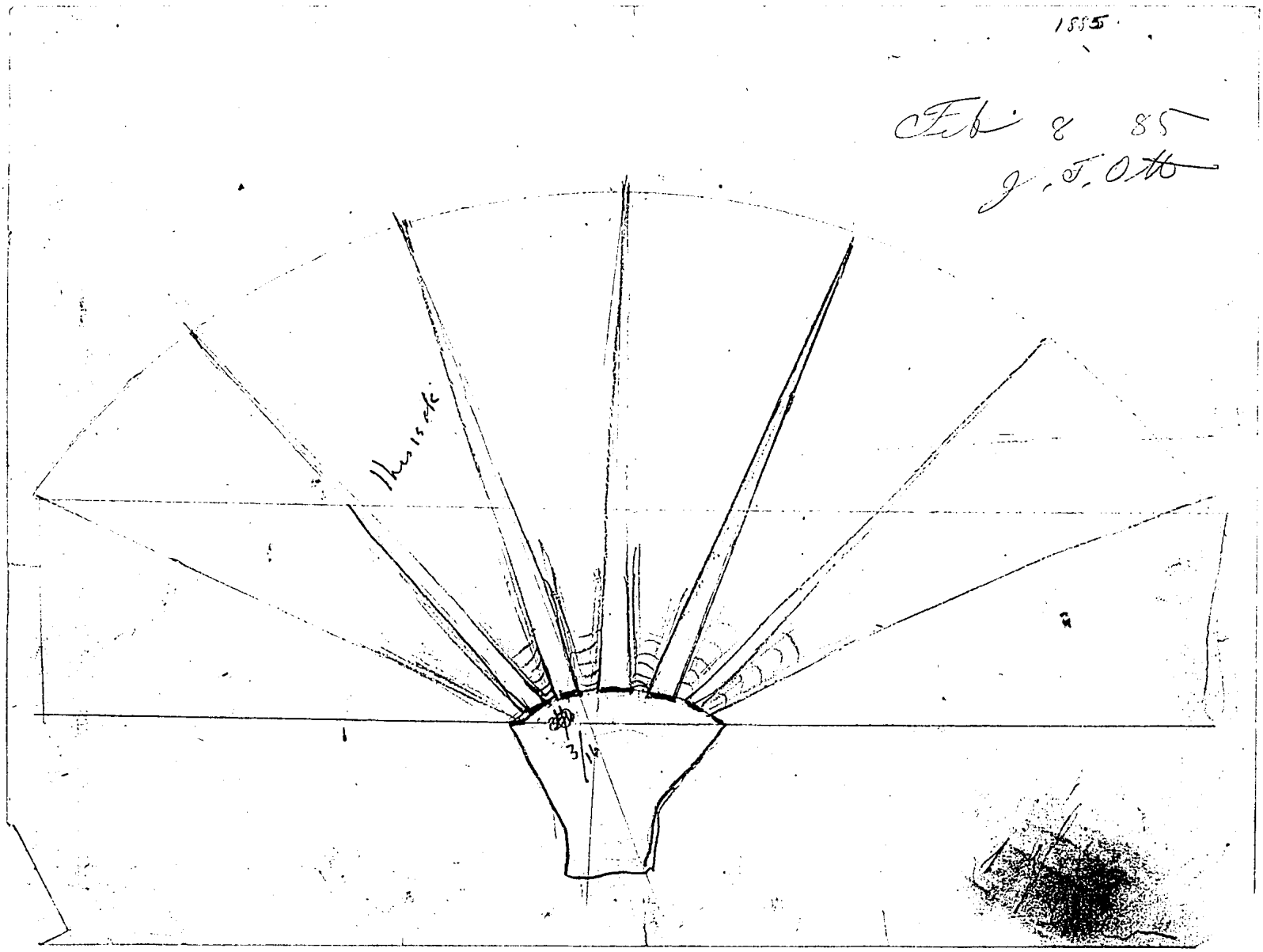


also 6 of 3½ dia
+ 6 inches long
also 6 of 3½ dia + 2 inches long

Make this of the thickest Gun
that can be got into the mould

Pol 862


1855
Feb 8 85
J. F. Otto

Form M.

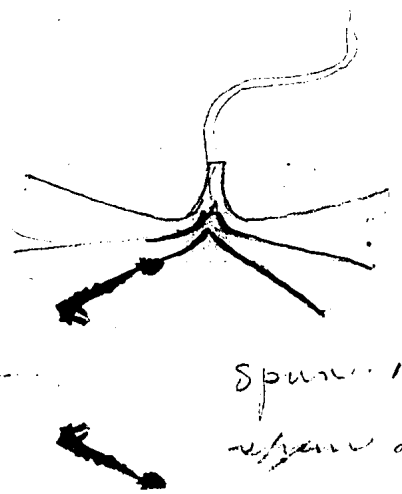
THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 Fifth Avenue.
NEW YORK.

*Address reply to*.....

W. D. RICH,
SUP'T OF CONSTRUCTION.

Feb 9 1885

J. F. Ott



Spun 10 inch
square of thin brass

THOMAS A. EDISON,
NO. 65 FIFTH AVENUE.

NEW YORK, 25 april 188 5

John

Have been experimenting on recording in Mallograph fine weight of new wire 10/1000 resting on sequin paper given special mark. Please have little mercury cup made of iron into which a globule mercury is placed have a pin about 1/32 dia put in middle extending above mercury then make iron marking wire bend end around so it fits the pin rather loose + lays down on the paper on drum of its own weight -
On the End of the long lever put Compole pens with the smallest lost motion between them to move the wire back + forward on the paper Your voice understood by the Phonograph — get this ready by tomorrow night some -

Also get the Mallograph that works a Sounder ready using

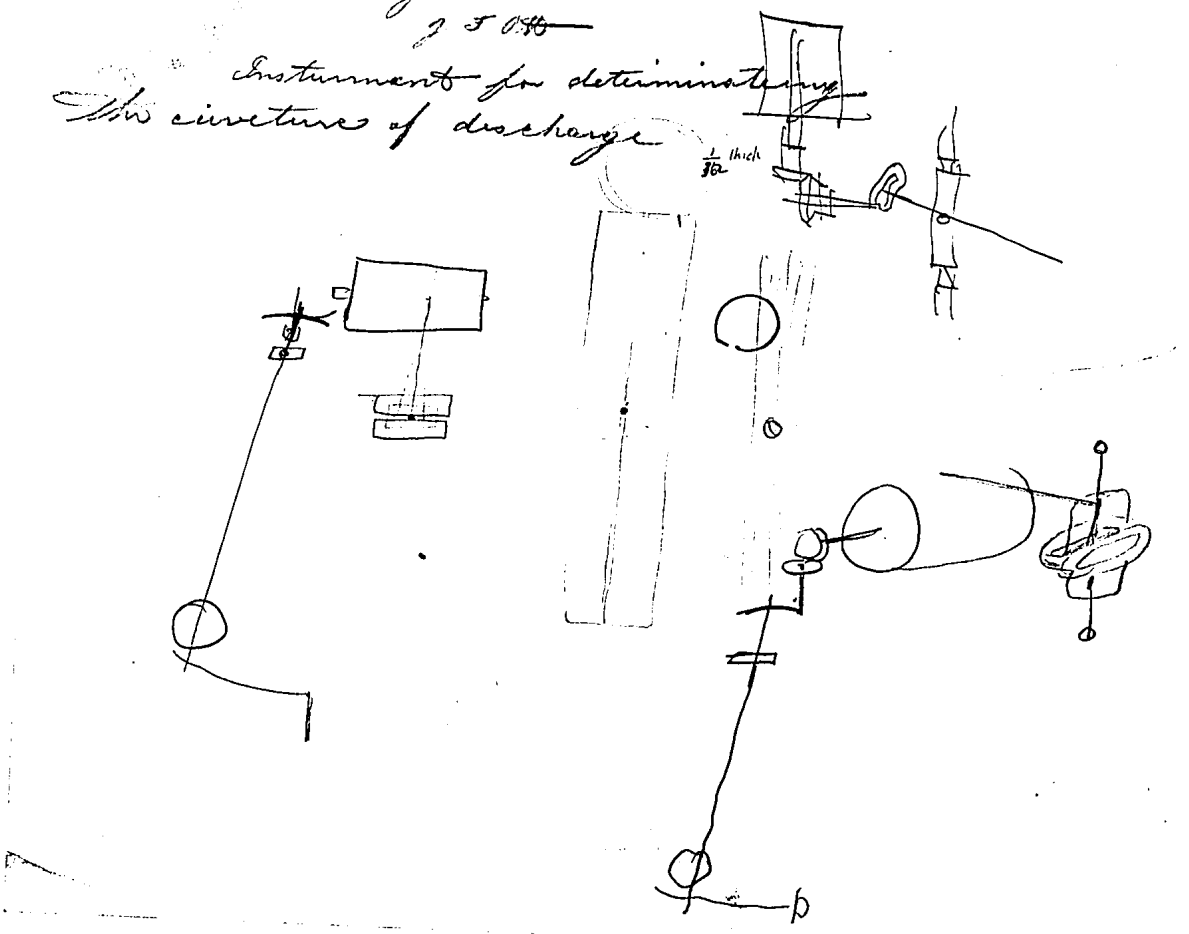
Finished

UNBOUND NOTES AND DRAWINGS

1886

May 20. 86

Instrument for determining the curvature of discharge



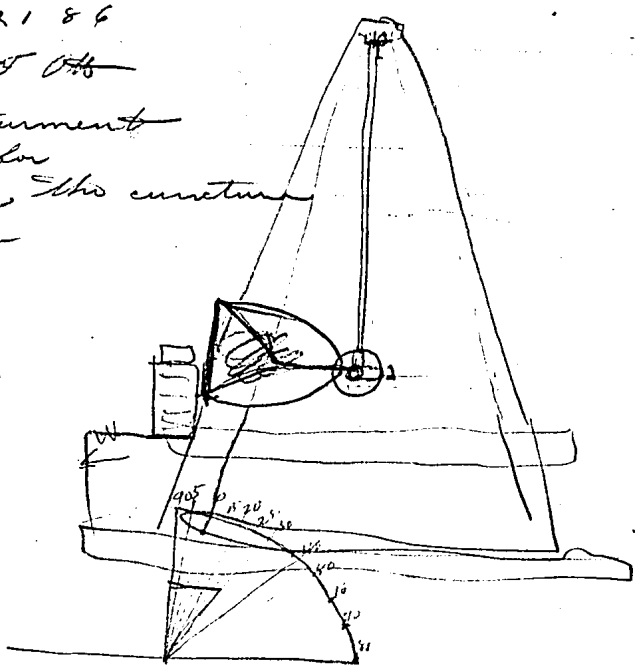
Sketch + notes

1886-05-21

May 21 86

J. T Otis

Instrument for determinating the curetur if discharge



Form M. M. 300-8-19-81.

# THOS. A. EDISON CONSTRUCTION DEP'T.

65 FIFTH AVENUE,

NEW YORK.

*Appropriation of time of* .....

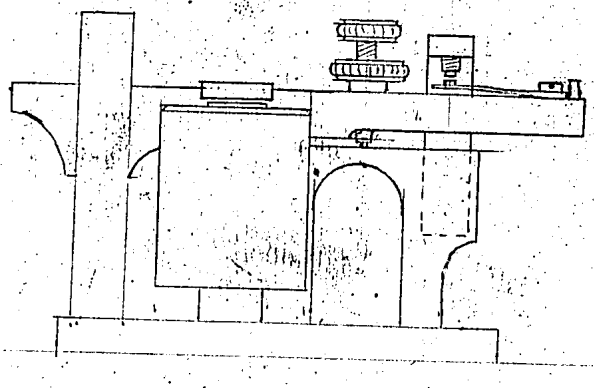
*employed as a* ..... *for week ending,*

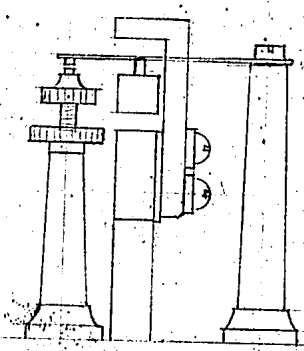
*Thursday,* ..... *188*

| TOWN. | No. of Days. | Rate Per Day. | AMOUNT. | TOTAL. Salary for Week. |
|---|---|---|---|---|
| | | | | |

D
1886 "Telegraph — Phonoplex" 2-

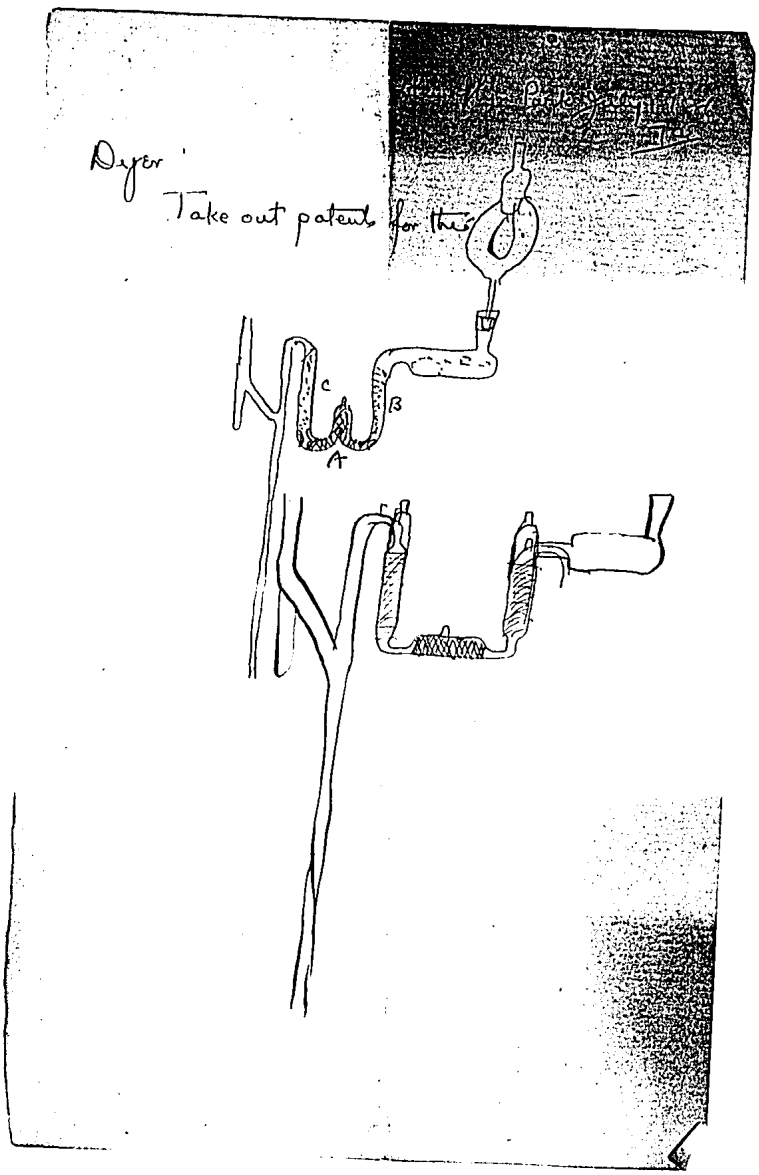
June 10. 86 Phonoplex
J. F. Ott
M. M. Force

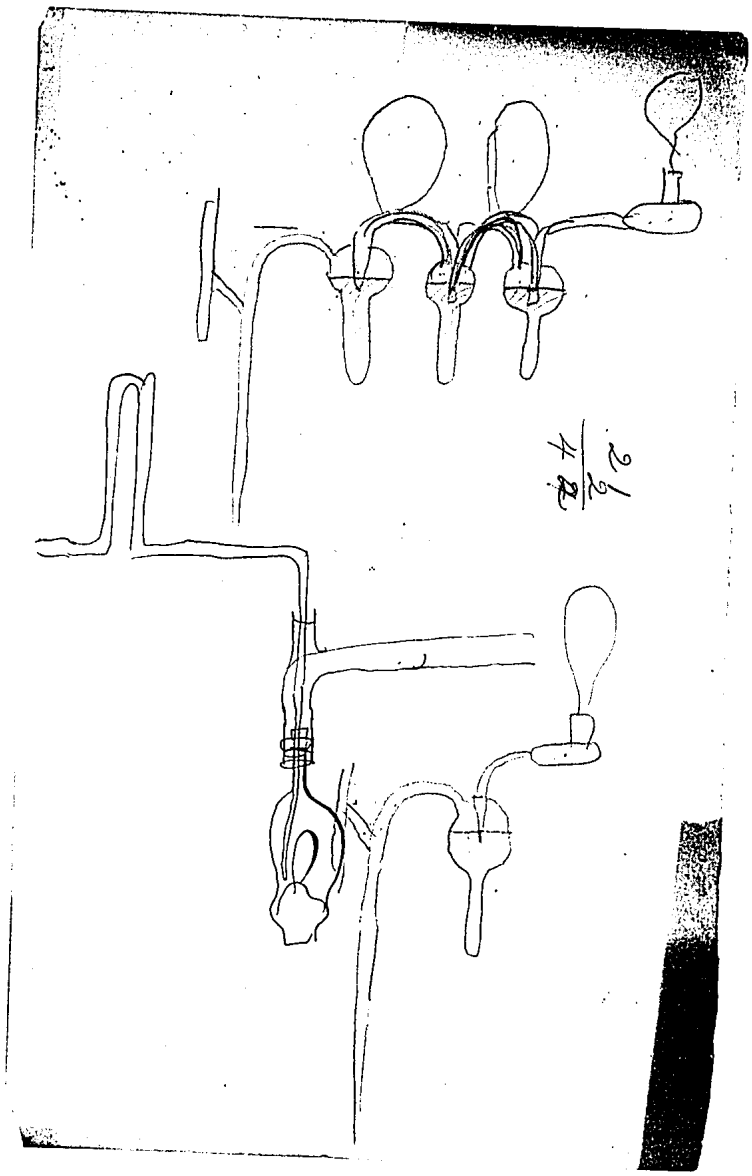


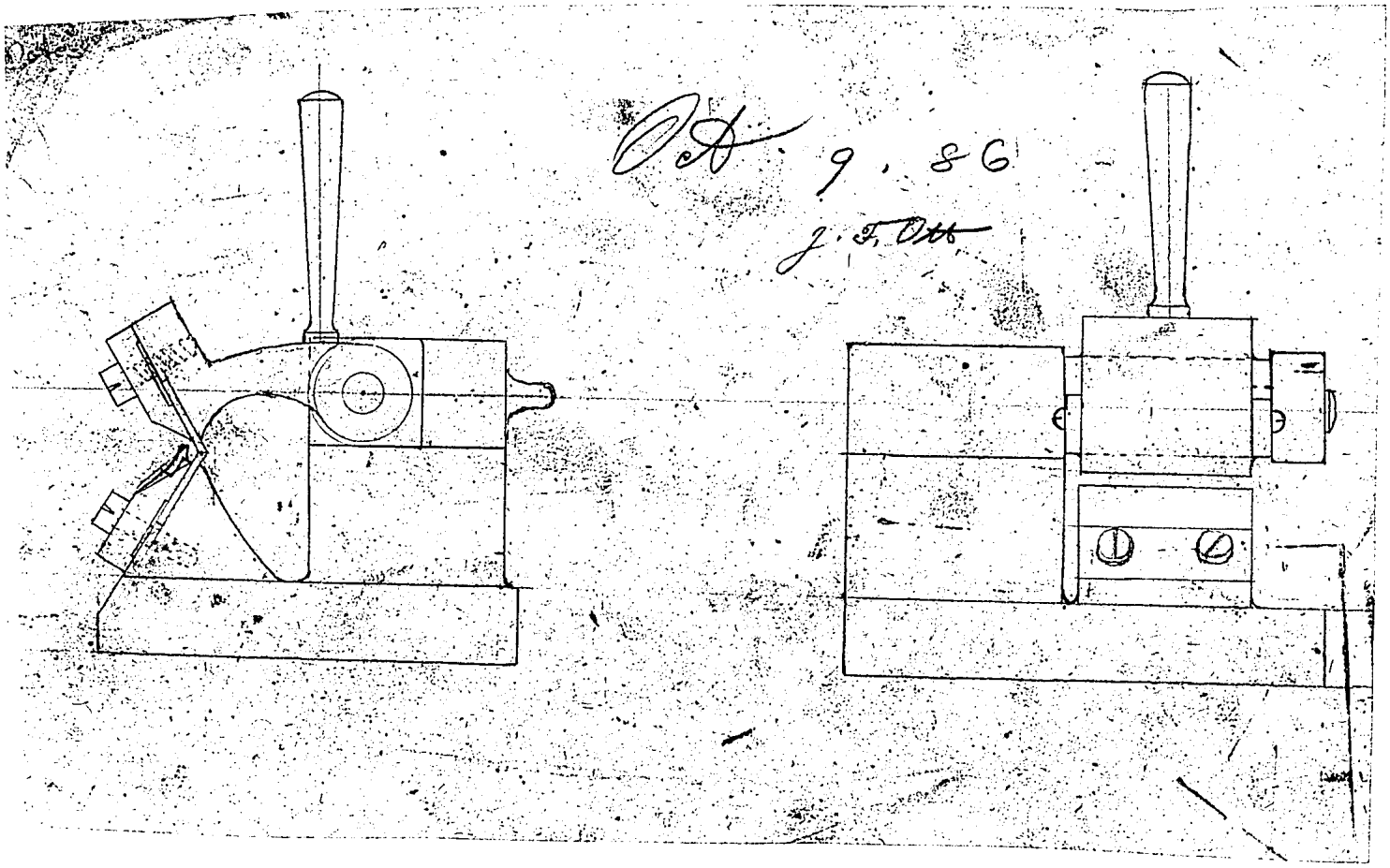


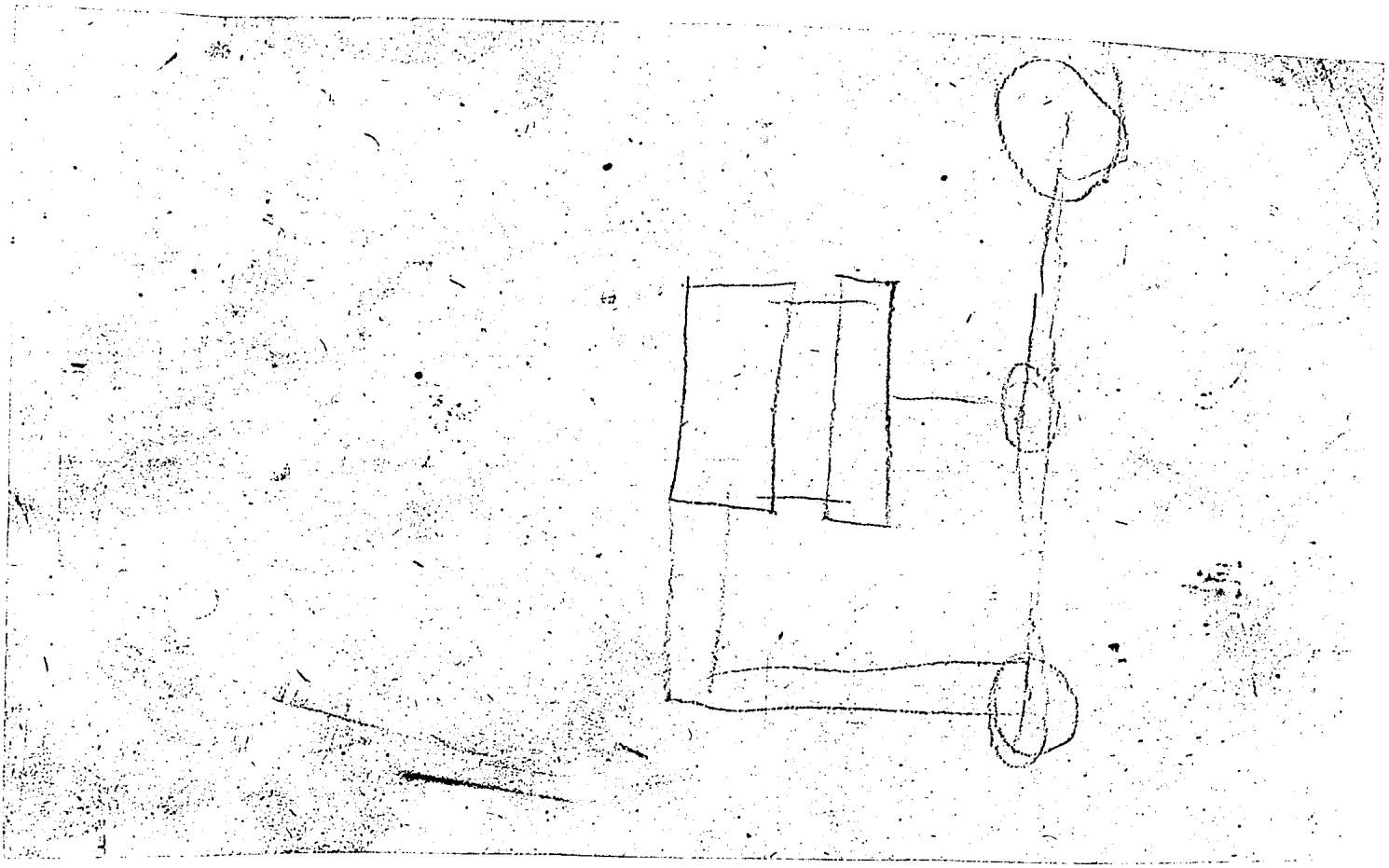
Dyer

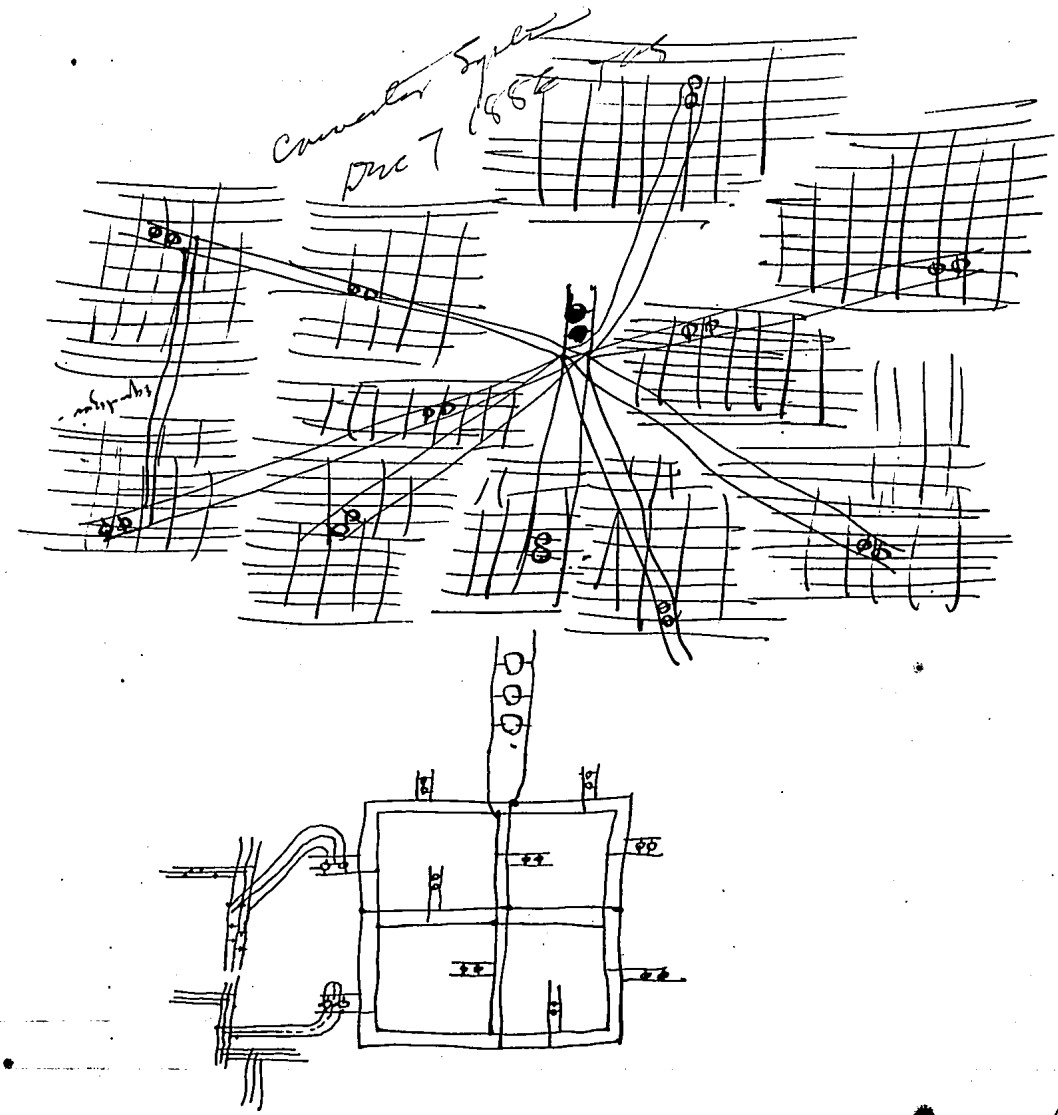
Take out patents for this



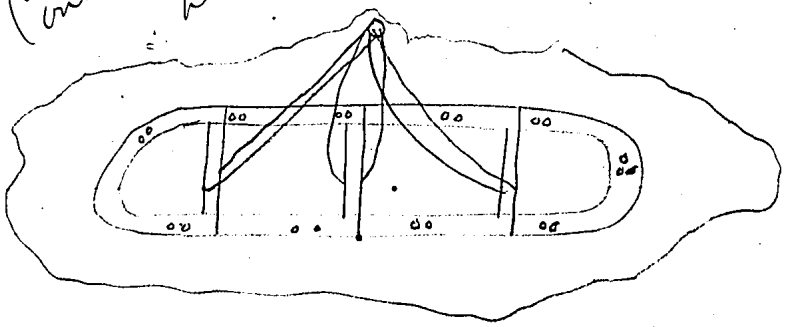


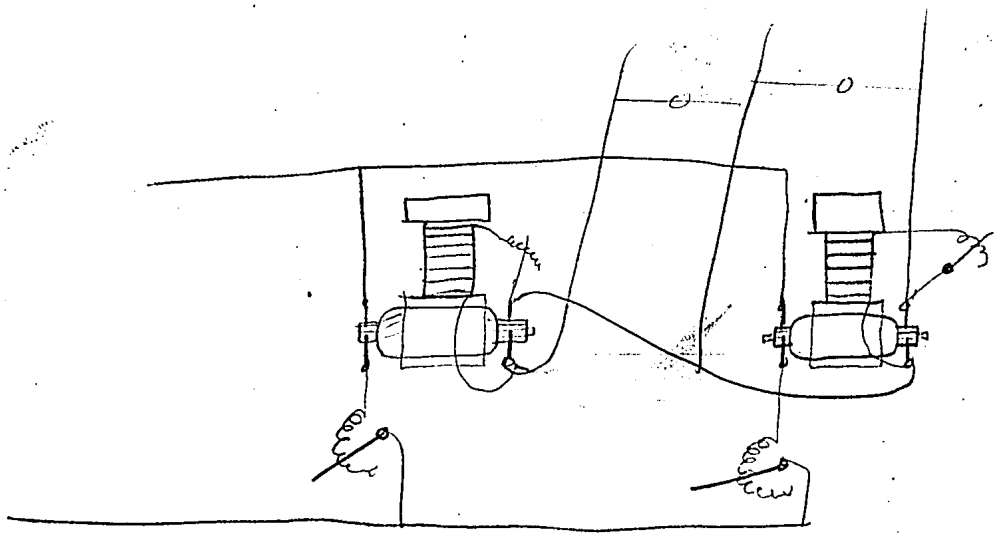

Oct. 9, 86
J. F. Ott

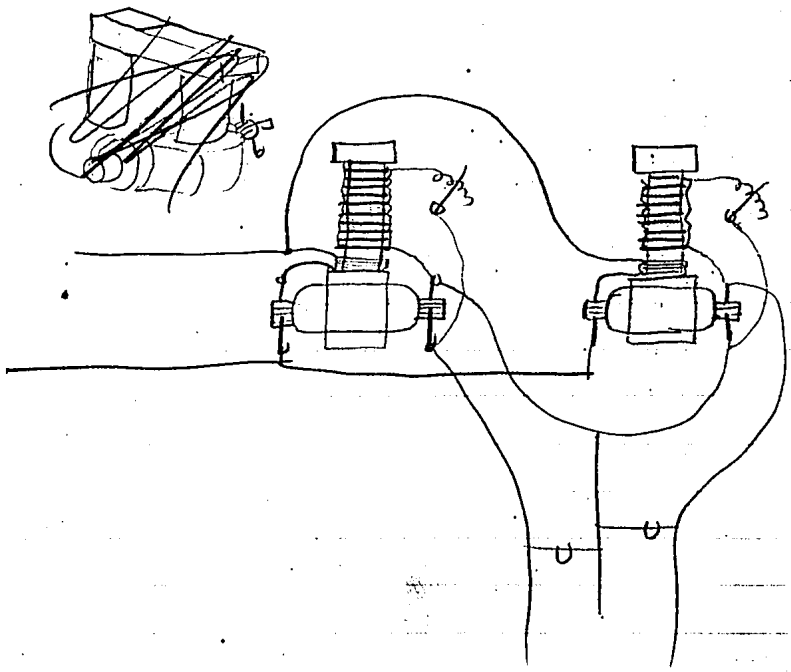


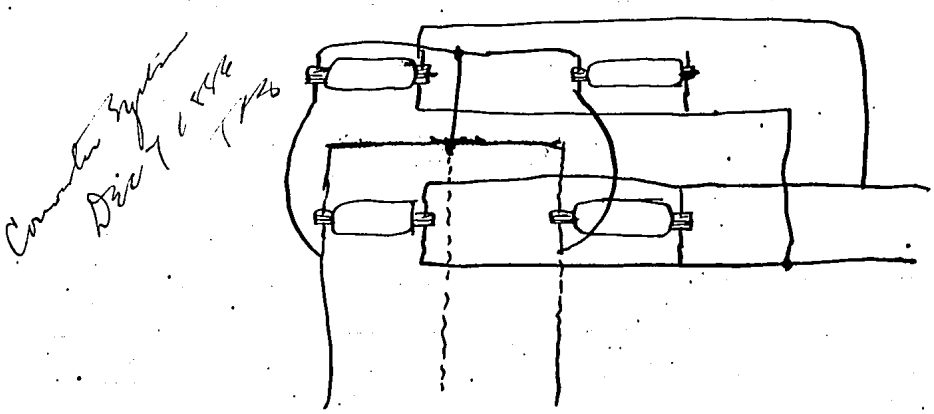


Converter System
Dec 7 1886



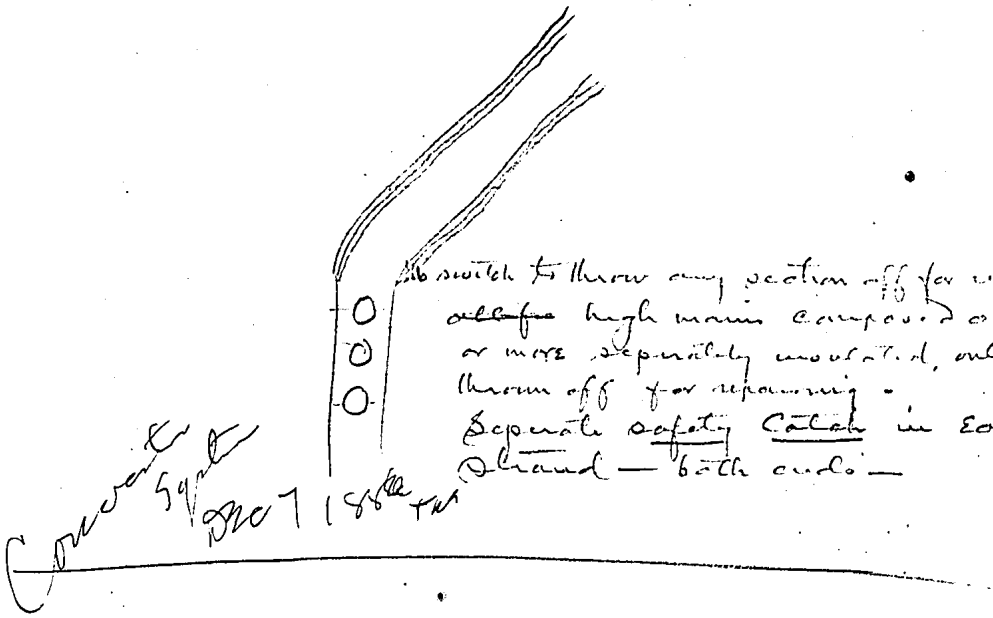


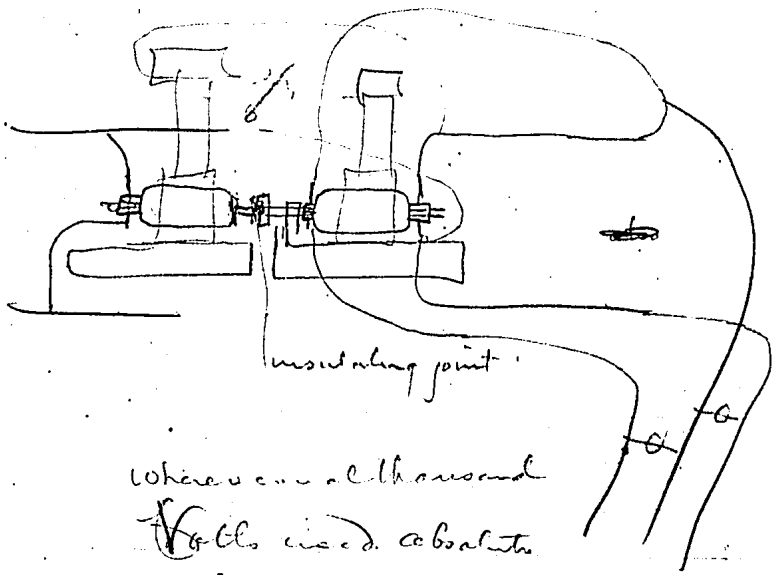




.atolation to put on Commutator

Connect field of low tension then armature, then it starts up as water running brang. run by line, then throw high armature on -




Where one of thousand Volts used, absolute insulation Edison 2 systems,

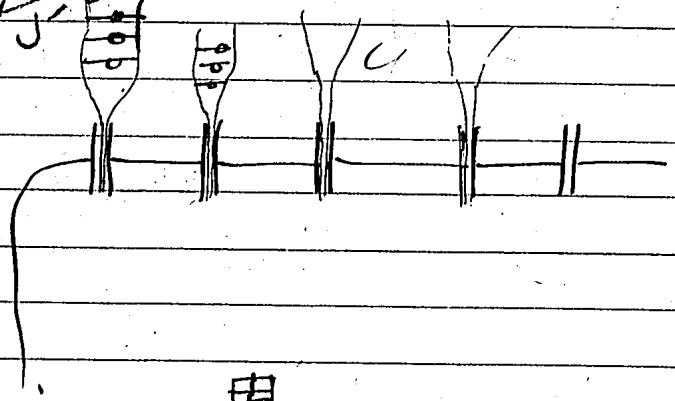
92
62
184

1308
6
7848
1308
2091 28
867

13887 0.4

(12) 7460
5710
13170
1500

Dec 7 1886
Tue

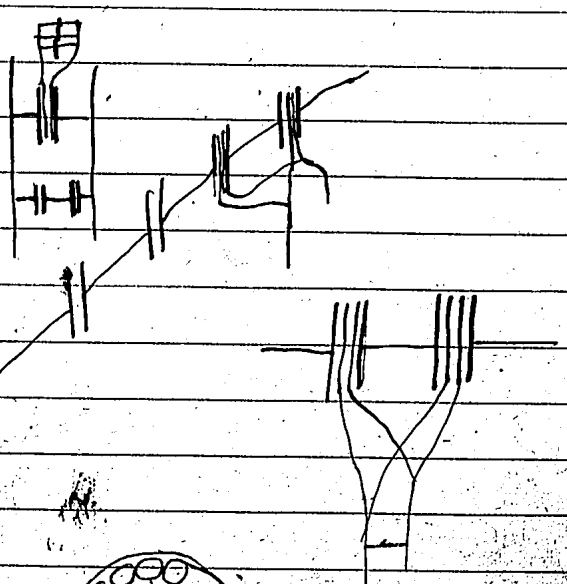


2 1746
3735

23.

373.

1600.



6000.

350

100.

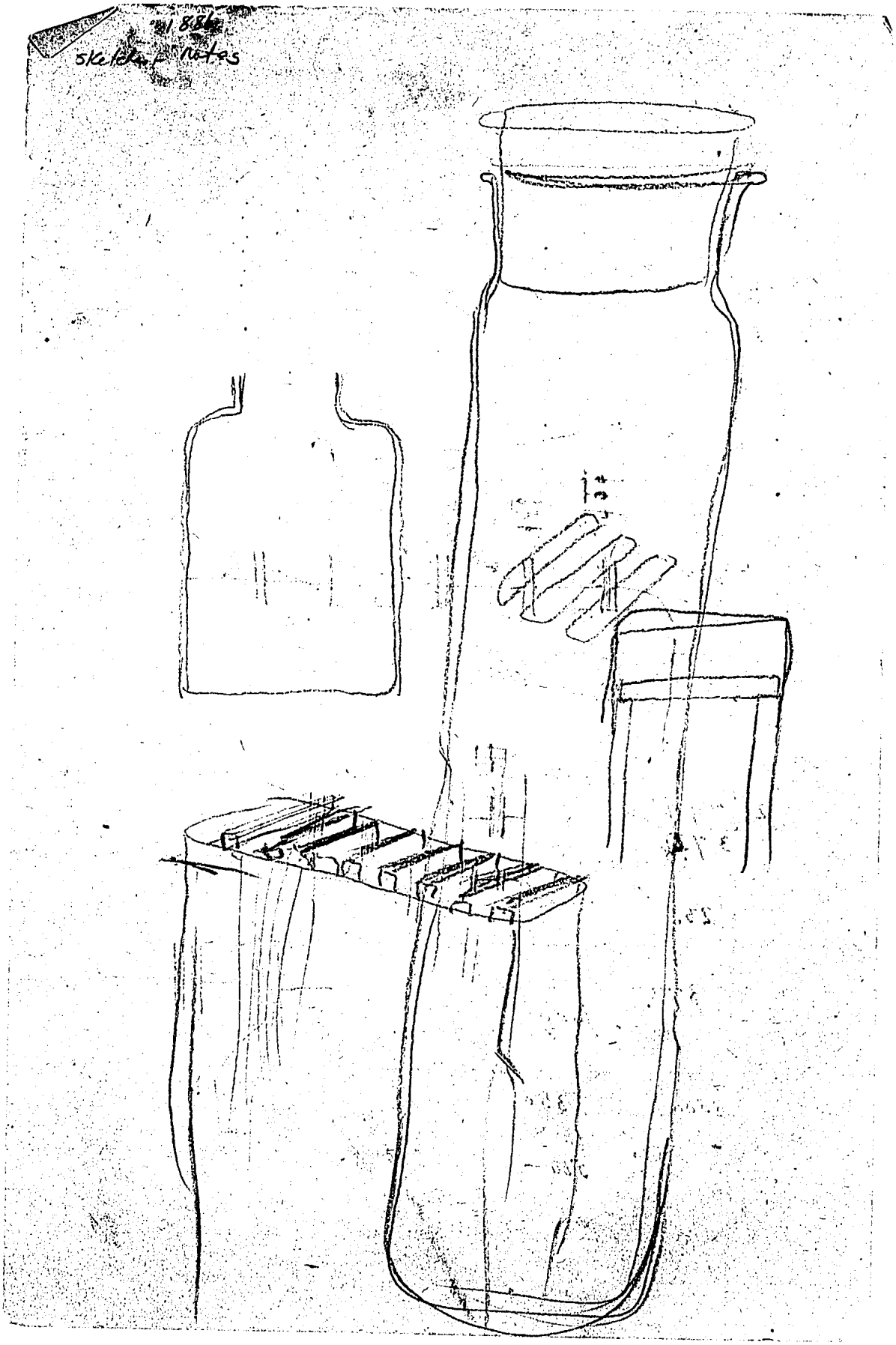
500

210

450

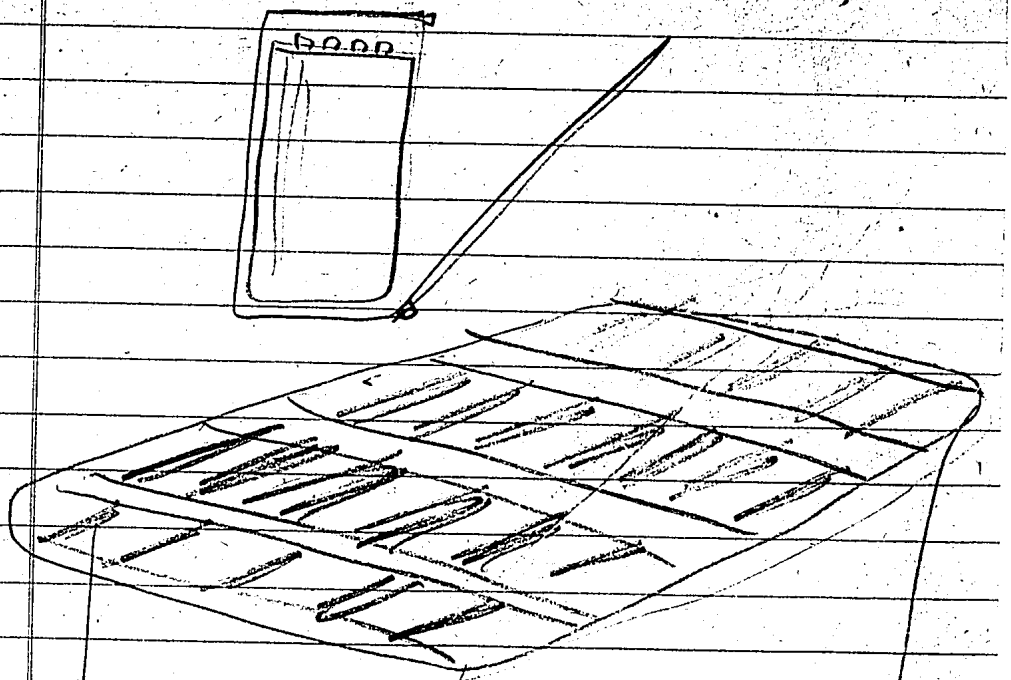
1884

Skeleton Notes



1886

Sketches + Notes



June 1886 Top

4 350

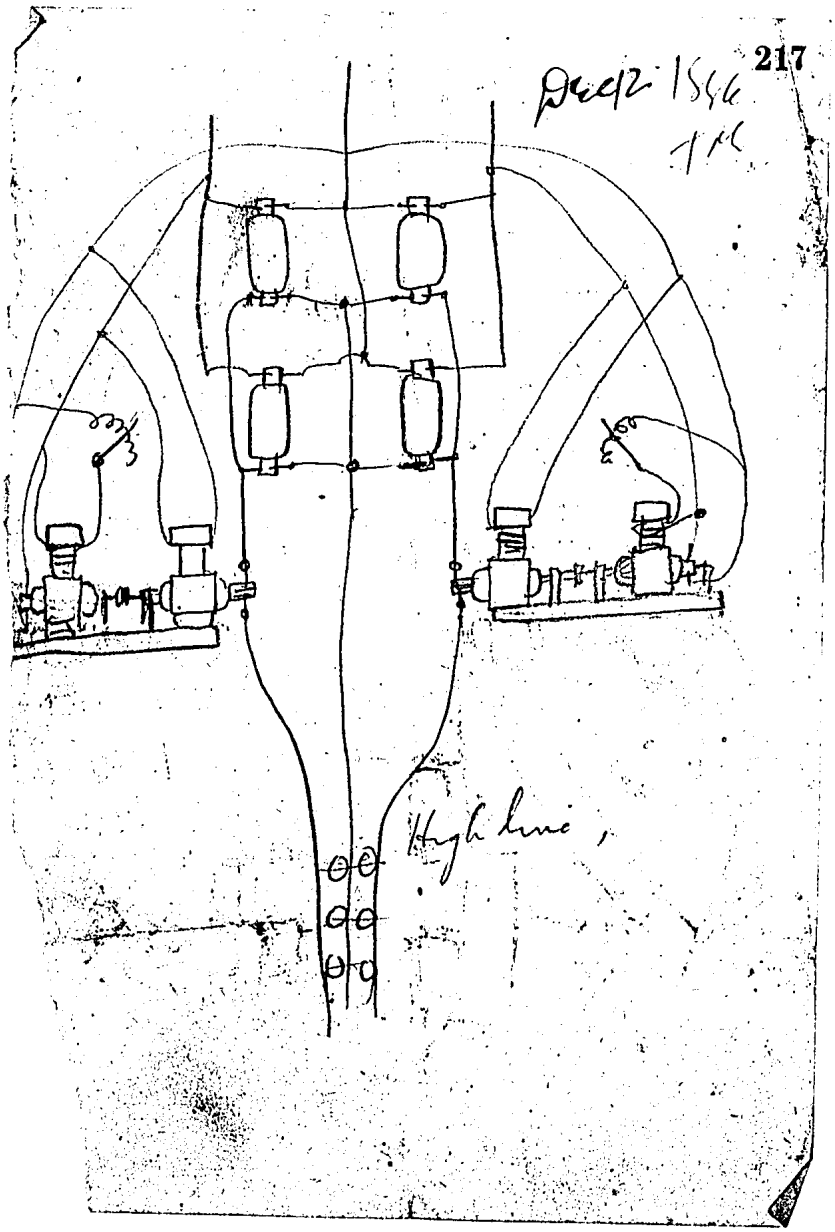
10 — 4 18 Iron uprights

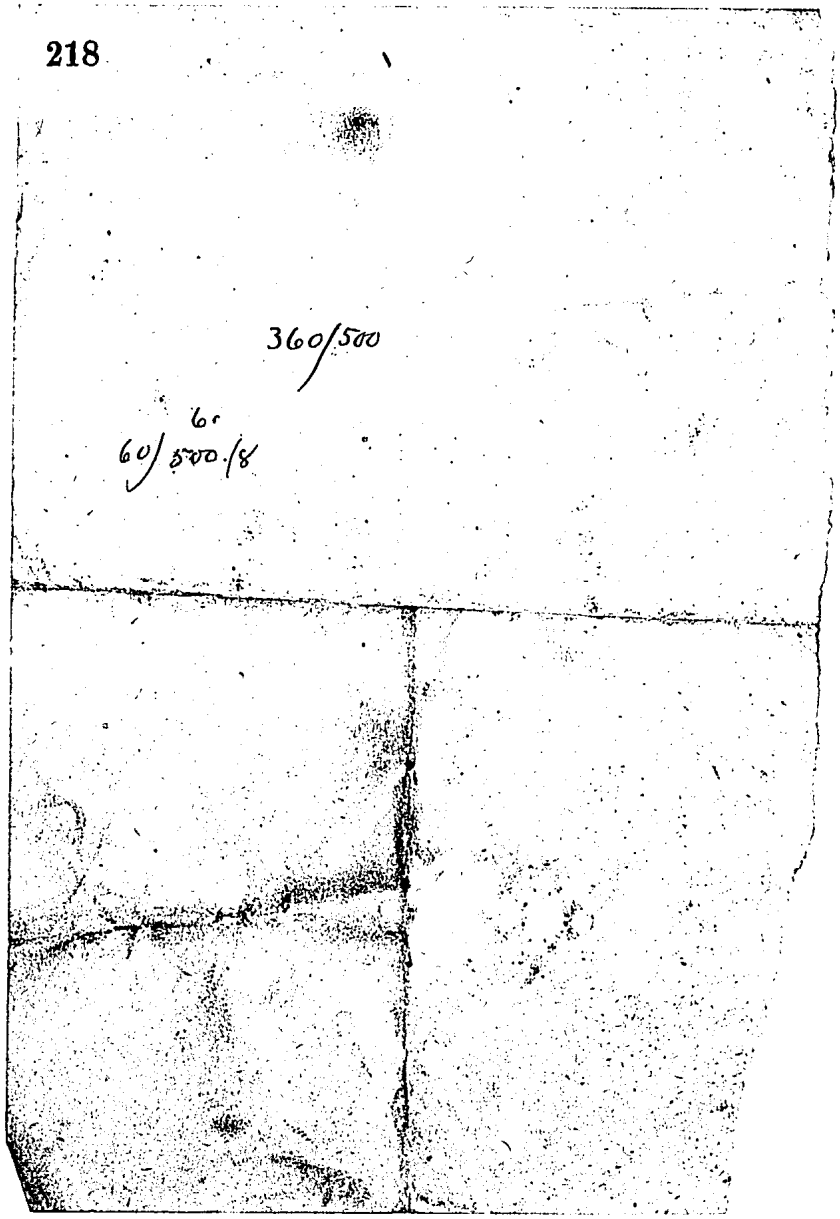
15 — 15 —

15 —

19 Handrail

Dec 12 1966




360/500
60
60/500.18

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*PART II*
*(1879–1886)*


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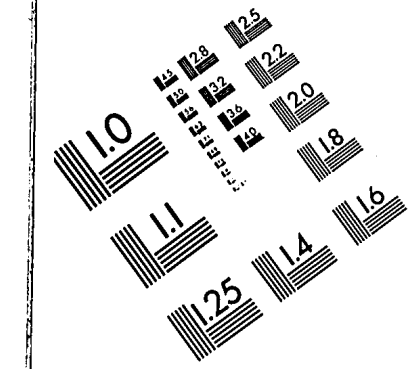


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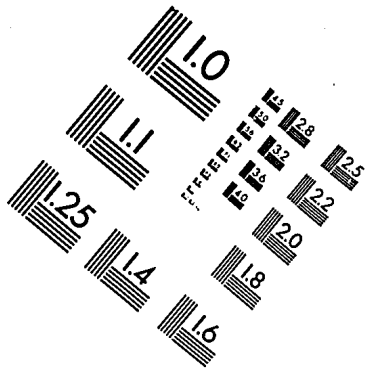
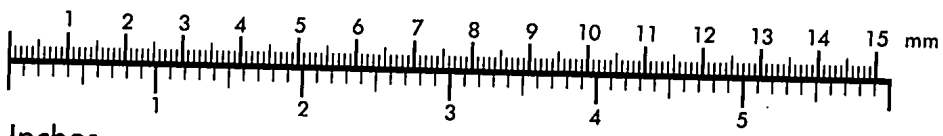



Centimeter




Inches